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ACADEMICAL

EXAMINATIONS

ON THE

PRACTICE OF SURGERY.

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ACADEMICAL

EXAMINATIONS

ON THE

PRACTICE OF SURGERY,

INTENDED

FOR THE USE OF STUDENTS.

BY W. GORDON,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS, EDINBURGH, &c. &c.

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TO THE

GENTLEMEN

ATTENDING THE SURGICAL LECTURES,

THIS LITTLE WORK

IS RESPECTFULLY DEDICATED

BY

THEIR SINCERE FRIEND

THE AUTHOR.

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ACADEMICAL EXAMINATIONS,

&c. &c.

Q. What is surgery?

A. Surgery may be defined that science which considers the nature of all injuries inflicted upon the living body, most external and many internal diseases, and attempts the accomplishment of their cure by the proper application of the hand, aided by the judicious use of instruments, internal and external medicines.

OF INFLAMMATION.

Q. What are the principal symptoms of local inflammation?

A. Redness, increased heat, pain, swelling, and interruption, or loss of function, are the chief symptoms of local inflammation.

Q. Are all these symptoms present in every case of inflammation?

A. No; in many instances only one or two of them are to be observed.

Q. Do they exist in inflammation of the internal or deep seated parts?

A. Certainly; one or more of them are invariably present in inflammation of the internal, as well as the external parts.

Q. Are the degree, continuance, and effects of these symptoms the same in every instance?

A. No; the character, violence, duration, and consequences of inflammation are influenced and modified by various circumstances ; but principally by the constitution of the patient, the cause of the inflammation, its extent, the organization of the part affected, its sensibility, and its importance in the animal economy.

Q. Into how many kinds is inflammation divided ?

A. Into healthy and unhealthy, common and specific, acute and chronic.

Q. What is meant by healthy inflammation ?

A. Healthy inflammation is that which occurs in a constitution in which there exists no derangement of the health, either local or general, to affect or influence the inflammatory action.

Q. What is meant by unhealthy inflammation ?

A. That which takes place in a debilitated constitution, or which has been caused, or its character modified by some previous local, or constitutional disorder.

Q. What is meant by specific inflammation ?

A. That which has been produced by the application of some irritating substance, or poison, to the body, and which presents symptoms peculiar to itself.

Q. When is inflammation said to be acute ?

A. When the local symptoms are violent, proceeding rapidly towards their termination, and exciting severe symptomatic fever and constitutional disorder.

Q. When is inflammation said to be chronic ?

A. When the local symptoms are mild and tardy in their progress, and the constitution but little, if at all affected.

Q. In what parts does inflammation proceed most favourably ?

A. In those which are nearest the source of the circulation, and in those which are highly organized and vascular.

Q. How do vital organs, which are all very vascular, undergo inflammation ?

A. In them inflammation goes on *less* favourably, because, during their derangement, the functions of general health are disturbed.

Q. What is the cause of redness in inflammation ?

A. The redness of an inflamed part is occasioned by the formation of new vessels in the extravasated coagulable lymph, and by an alteration in the state of the blood itself, which looses its natural structure, and at the same time acquires a very deep red colour.

Q. How is the increased heat in inflammation accounted for ?

A. As animal heat is generated by the influence of the brain and nerves, by the decomposition of atmospheric air in the lungs, and by the changes which the blood undergoes in the course of its circulation through the body, it is supposed that increased heat, must always succeed increased nervous and vascular action.

Q. Is this increased heat most perceptible in the internal or external parts of the body ?

A. In the external; especially in the palms of the hands and soles of the feet.

Q. Is the heat in an inflamed part really much increased above the standard of health, or at all proportionate to the sensations of the patient ?

A. No ; the heat of an inflamed part, even when this is situated internally, seldom exceeds the natural temperature of the blood, which is generally about 98°. of Fahrenheit's thermometer.

Q. When is the sensation of heat most, and when least distressing to the patient ?

A. It is most intolerable when the inflammatory action is severe, and when the organ affected is possessed of great natural sensibility ; and it is least felt in inflammation of those parts which are lubricated by the mucous fluids.

Q. What is the cause of pain in inflamed parts ?

A. The pain attending inflammation arises chiefly from compression or distension of the nerves ; it depends also in some degree upon the peculiar change which these organs suffer in consequence of increased vascular action.

Q. What parts, when in a state of inflammation occasion the most severe pain?

A. Those which have an abundant ramification of nerves, as the skin and eye; those whose texture is firm, as the bones and tendons; and hollow muscular viscera, as the stomach, intestines, and bladder; which are continually contracting and dilating.

Q. Can you assign any reason why rigidity of structure should render the pain more severe?

A. Yes. It has been observed that an effusion from the serous vessels of an inflamed part is always productive of an abatement of the increased vascular action, and preternatural sensibility; in parts, however, whose organization is unyielding and firm, no such effusion can take place, the congestion therefore of the vessels remains unrelieved, and the patient is longer before he experiences any diminution of pain.

Q. What is the cause of swelling in inflammation?

A. The swelling which attends inflammation is produced by the increased quantity of red blood in the vessels of the inflamed part, by the effusion of serum and coagulable lymph, and by the interrupted state of the process of absorption.

Q. Is inflammation most violent at the point next the internal or external surface of the body?

A. Next the external surface.

Q. What is meant by symptomatic fever?

A. Symptomatic fever is that febrile state of the general system which is occasioned by severe, or extensive local inflammation.

Q. What are the symptoms of symptomatic or inflammatory fever?

A. The symptoms of symptomatic fever frequently vary according to the constitution of the patient, and the kind of organ or part affected, but the ordinary ones, are, a quick, full, and strong pulse, restlessness, hot dry skin, head-ache, flushed countenance, foul and parched tongue, thirst, nausea, loss of appetite, scanty and high coloured urine, costiveness and sometimes delirium.

Q. In inflammation of what parts is symptomatic fever most likely to come on, and is most severe?

A. In inflammation of tendons, bones and ligaments, as we observe in a large joint when inflamed; in inflammation of very sensible parts, as the skin; in inflammation of vital organs, as the lungs; and in inflammation of parts which readily sympathize with the vital organs, as the testicle.

Q. Do the constitutional and local symptoms always present themselves at the same time?

A. In inflammation of the great cavities, or their viscera they do, but the local precede the constitutional in inflammation from external injury; and the constitutional the local in erysipelas and eruptive diseases.

Q. How are the causes of inflammation generally divided?

A. Into remote and proximate.

Q. How are the remote causes divided?

A. Into two classes, viz. chemical and mechanical stimuli.

Q. Which are the chemical stimuli?

A. Cantharides, heat, strong acids, several gaseous substances, and animal poisons.

Q. Which are the mechanical stimuli?

A. External injuries; as bruises and wounds.

Q. Are there any other causes of inflammation?

A. Yes; fevers and cold.

Q. What is the proximate cause of inflammation?

A. Dilatation of the capillary vessels, and a retardation or even stagnation of blood in them, and an excitement of the arteries running to the inflamed part.

Q. Explain more fully the theory of inflammation?

A. Modern pathologists have discovered that the capillaries and serous vessels of an inflamed part are debilitated and increased beyond their natural size; that they admit a greater quantity of blood, which flows more slowly in them than in a state of health, and that the arteries leading to the inflamed part are increased in action, and that the blood circulates through them with preternatural velocity.

Different Terminations of Inflammation.

Q. What are the terminations of inflammation?

A. Resolution, adhesion, suppuration, mortification, scirrhus, effusion and ulceration.

Q. What is the general termination of inflammation of the cellular substance, of mucous and of serous membrane, of muscles and of glandular structure?

A. Inflammation of cellular substance commonly terminates in resolution or suppuration; of mucous membrane, in suppuration or ulceration; of serous membrane, in resolution, adhesion, or effusion; of muscles, in resolution or gelatinous effusion; of glandular parts, in resolution or scirrhus.

Q. What influences inflammation in its termination?

A. The cause and the degree of the inflammation; and the structure, situation, and importance of the part affected.

Q. Which are the most favourable terminations of inflammation?

A. Resolution and adhesion.

Q. Which is the most common termination?

A. Resolution.

Q. What is meant by resolution?

A. A cessation of the inflammatory action; the diseased part returning to its natural state and function, without the intervention of any of the other terminations of inflammation.

Q. What is the theory of spontaneous resolution?

A. When inflammation is terminated by resolution, there takes place an effusion of serum and fibrin into the cellular substance, by which the morbidly increased vascular action is diminished, and at length completely checked.

Q. How are the remedies of inflammation divided?

A. They are usually divided into general and local.

Q. Which are the general?

A. Venesection, purgatives, diaphoretics, and low diet.

Q. Which are the local ?

A. Removal of the exciting cause, local bleeding, cold applications, rubefacients, warm fomentations and poultices, and in certain circumstances astringents.

Q. What is the first circumstance to be attended to in the treatment of every inflammation ?

A. To remove, if possible, or to moderate the operation of the exciting cause.

Q. Explain how general blood-letting is useful in inflammation ?

A. General blood-letting diminishes the quantity of the circulating blood, reduces the strength and frequency of the arterial pulsations, and lessens the morbidly increased action of the whole sanguiferous system, and of the inflamed part in particular.

Q. What circumstances indicate the necessity of bleeding ?

A. When the patient is young, vigorous, and plethoric ; when the inflammation is recent, severe or extensive ; and when the part affected is a very sensible, delicate, or important one, bleeding should be had recourse to.

Q. In what cases would you be cautious in the general abstraction of blood ?

A. When together with the inflammation there exists disorder of the digestive organs ; when the inflammation is purely local or not severe ; when it has existed some time ; when the patient is feeble or old ; when the affected part has lost its tone, or is much indurated yet free from pain, blood should be taken away very sparingly.

Q. When is bleeding most successful ?

A. When employed early in the disease, and when the blood is taken away rapidly and in great quantities at once.

Q. What quantity of blood should be taken away at one time ?

A. This will depend upon the organ affected, the violence of the inflammation, and the age and vigour of the patient.

Q. If the inflammation be not subdued by the first bleeding, what symptoms would lead you to repeat it ?

A. A continuance of pain ; the pulse remaining strong, quick, and hard ; the crassamentum of the blood being firm, cupped and exhibiting the buffy coat.

Q. What is the crassamentum ?

A. One of the component parts of the blood ; it is solid, and consists of fibrina and red globules.

Q. What is the other component part ?

A. It is called serum ; it is fluid, and is composed of water, albumen, and several saline compounds.

Q. What is meant by the buffy coat of the blood ?

A. When the coagulation of the blood is slow, the component parts of the crassamentum separate from each other, and the fibrina appears like a white crust covering the surface of the red globules, which sink to the bottom of the vessel, in consequence of their greater comparative specific gravity ; such appearance has received the appellation of buffy coat.

Q. What is the cause of an accumulation of fibrina in the blood ?

A. An interrupted state of the process of secretion.

Q. What does the presence of the buffy coat indicate?

A. An accelerated motion of the blood and suspended nutrition.

Q. Is it not a certain mark of inflammation ?

A. No ; for it is observed in the coagulated blood of pregnant females ; in active hemorrhage ; in certain very old and nervous people in whom no indications of inflammation exist ; and is *not* seen if the inflammation be strictly local.

Q. What is there peculiar to the blood of patients labouring under inflammation ?

A. It coagulates very slowly, its texture is remarkably firm, and the upper surface of the crassamentum is concave.

Q. What consequences would ensue from large bleedings in the latter stages of inflammation ?

A. Effusion or gangrene.

Q. How are purgatives useful in inflammation ?

A. By causing the contents of the bowels to be more speedily evacuated, they remove a source of much irritation; and by increasing the different secretions poured into the intestinal canal, they diminish the quantity of the fluids of the body; and thus reduce the inflammation and general excitement.

Q. What purges are the best?

A. The saline ones; because they not only empty the bowels, but likewise possess direct refrigerant powers, and increase the abdominal secretions more than any other cathartics.

Q. In what inflammations are purgative medicines most useful?

A. They are indispensable in almost every kind of inflammation, but they are of greatest utility in those of the head, throat, and abdomen.

Q. When are clysters necessary?

A. In some cases of inflammation within the abdomen, when the mildest purgatives cannot be safely given, when these are vomited, or when their operation is tardy.

Q. Explain how diaphoretics are beneficial in inflammatory affections?

A. By causing the blood to flow from the internal parts to the surface of the body, they effect an equal distribution of it, and prevent its undue or dangerous accumulation in any particular organ; and by increasing the secretion from the exhalants of the skin, they preserve it moist, at the same time lessen the mass of the circulating fluids, and by the nausea they generally occasion, greatly assist in lowering the pulse and febrile excitement.

Q. In what manner should diaphoretics be administered?

A. Not in such doses as to produce vomiting or profuse sweat, but in such proportions as to cause gentle diaphoresis and slight nausea.

Q. In what inflammations are diaphoretics and nauseating medicines most useful?

A. In those of the head, chest, and several of the abdominal viscera, besides those of the skin and external parts.

Q. Where is their employment inadmissible?

A. In inflammation of the stomach and upper portion of the intestines.

Q. Which diaphoretics are the best?

A. The tartrate of antimony, Dover's powder, and the warm bath.

Q. Is opium a useful remedy in inflammation?

A. By some celebrated Surgeons it has been strongly recommended after bleeding and purgatives; by others, it has been much condemned, or only advised in the very last stages of inflammation, or in those accompanied with typhoid fever.

Q. What diet and regimen are to be recommended in inflammation?

A. Low diet, diluent drinks, and rest, are always to be prescribed; stimulating liquors and animal food must be rigidly abstained from, even after the inflammation appears to have subsided.

Q. What circumstances are to be attended to in topical bleeding?

A. The blood should be taken away as near to the inflamed part, and as freely and rapidly from it as possible, and as frequently as necessary.

Q. How does cold operate in reducing inflammation?

A. It diminishes the temperature of the part, tranquillizes the inordinate action of the neighbouring arteries, and lessens the pain and preternatural sensibility.

Q. How is it best applied?

A. By keeping cloths, moistened with cold liquids, continually applied to the inflamed part, and to those in its immediate vicinity.

Q. Which are the best cold applications?

A. Cold water, ice, vinegar, spirits of wine, solutions of acetas plumbi, sulphas zinci, and murias ammoniæ.

Q. Have the preparations of lead ever been objected to as remedies for inflammation?

A. The preparations of lead have, by some, been considered as dangerous applications to inflamed parts, from the supposition that they may become absorbed, and produce the disease called colica pictonum.

Q. Does experience corroborate this supposition ?

A. The most celebrated and observant surgeons have never witnessed any bad effects to arise from the application of the preparations of lead to inflamed surfaces, even when these have been very extensive.

Q. From what circumstance do alkohol and ether prove beneficial in inflammation ?

A. In consequence of their extremely rapid evaporation, they speedily reduce the increased temperature, and consequently diminish the irritability and pain of inflamed parts.

Q. When are they best employed ?

A. When the inflammation has been moderated by previous depletion, or when it is attended with an extravasation of the fluids, causing considerable intumescence of the part.

Q. In what cases of inflammation are warm applications to be resorted to ?

A. In inflammations occurring in very irritable constitutions ; in those which are very violent ; in those likely to terminate in, or which cannot be cured without suppuration ; in those of glandular and firmly organized parts ; in those also which are deep-seated, or which exist in any of the viscera of the abdomen.

Q. What is the best criterion by which you determine whether to use cold or warm applications ?

A. The feelings of the patient.

Q. What bad effects are sometimes produced by applying cold to inflamed glandular parts ?

A. Scirrhus is sometimes the consequence of such treatment.

Q. On what principle do blisters and rubefacients subdue inflammation ?

A. By the pain they occasion ; they diminish the morbid sensibility, and by producing an afflux of blood to the part to which they are applied, they lessen the quantity sent to the seat of the inflammation, and thus tend to remove the disease.

Q. What circumstances are to be attended to in the use of blisters?

A. They should never be applied to the parts actually inflamed; nor, while the local inflammation, or its attendant constitutional affections, continue very severe.

Q. When are astringents to be had recourse to?

A. When the inflammation is very slight, or when it has become chronic.

Chronic Inflammation.

Q. What are the symptoms of chronic inflammation?

A. Chronic inflammation is characterized by an indurated circumscribed swelling of the part, accompanied with little or no pain, slight augmentation of temperature, no redness, and seldom, if ever, any fever.

Q. In what individuals is chronic inflammation most frequently observed?

A. In those whose constitution is enfeebled and relaxed, and in those who are somewhat advanced in life.

Q. What is the most frequent termination of chronic inflammation?

A. Chronic abscess.

Q. How would you treat chronic inflammation?

A. The *general* remedies to be used are gentle aperients, country air, moderate exercise, light nutritious diet, tonic medicines, as preparations of iron, &c.; the *local* ones are friction, blisters, and caustic issues.

ADHESION.

Q. What is understood by the term adhesion?

A. When, after inflammation, the lungs adhere to the pleura costalis, the intestines to the peritonæum, or when the opposite sides of a wound grow together without any suppuration taking place; such parts are said to be united by adhesion, or adhesive inflammation.

Q. How is adhesion produced?

A. The vessels of the opposite inflamed surfaces, discharge a serous fluid, the thinner parts of which the absorbents remove, but leave the albuminous, into which the smaller arteries extend themselves, and convert it into an organized substance, by which an intimate connexion is established between the separated parts.

Q. In what structures does adhesive inflammation most readily take place?

A. In serous membrane, and cellular substance.

Q. By what means do we ensure or favour the process of adhesion?

A. By removing all extraneous bodies, as blood, pieces of cloth, bone, &c. from between the separated parts, which we must keep in a relaxed and easy posture, and preserve in close contact, either by bandage, adhesive plaster, or sutures.

Q. What circumstances impede the process of adhesion?

A. An unhealthy state of the constitution, the presence of foreign bodies, excessive inflammation, and the effects of mercury upon the system.

Q. Will parts, completely severed from the body, ever reunite?

A. Most assuredly they will, if replaced before their vital principle is extinct.

Q. At what period of life does adhesion soonest take place?

A. In youth.

SUPPURATION.

Q. What is meant by suppuration?

A. When, during inflammation, there is produced in the part in which it exists, a bland cream-coloured fluid, called pus, suppuration is said to have taken place.

Q. In what structures does suppuration most readily occur?

A. In mucous and cellular structure.

Q. Can suppuration be induced without ulceration?

A. Innumerable facts prove to us that it can; we observe it, for instance, in the mucous membrane, which lines the fauces and urethra, in catarrh, and gonorrhœa, and upon those parts of the skin, to which perpetual blisters have been applied.

Q. What is the theory of suppuration?

A. While the ancients considered pus to be a solution of the living solids, the moderns have ascertained that it is a fluid derived from the blood by the action of the vessels of the inflamed part, somewhat similar to secretion.

Q. Can pus be formed without inflammation?

A. Some authors have imagined that a certain kind of puriform matter can be produced without previous inflammation; others again assert that no suppuration whatever can take place without some degree of inflammatory action preceding it.

Q. What are the qualities of pus?

A. Healthy pus is a thick, yellowish coloured fluid, heavier than water, and consisting of globules, suspended in a fluid, which becomes coagulated in a solution of muriate of ammonia.

Q. What are the characters of morbid pus?

A. When the constitution, or the surface from which the matter is discharged, is in an unhealthy condition, the pus becomes thinner, of a darker appearance, offensive, more irritating, having a greater disposition to putrefaction, and tinging black, silver instruments besmeared with it.

Q. What are the symptoms of suppuration?

A. When suppuration comes on, the throbbing acute pain with which the part was first affected is diminished, and at length changed into one of a dull, heavy kind; the tumour has a white pointed spot on its middle part; there is an evident fluctuation within it; and if the suppuration be extensive, or in any important viscus, the patient is attacked with rigours more or less violent.

ABSCESS.

Q. What is an abscess?

A. A collection of purulent matter.

Q. How are abscesses divided?

A. Into acute and chronic.

Q. What forms the sac of abscesses?

A. Organized coagulating lymph, which is thicker or thinner, in proportion to the duration of the inflammatory action; it is furnished both with absorbing and secreting vessels.

Q. What treatment would you pursue when parts are *likely* to terminate in suppuration?

A. Apply poultices and warm fomentations.

Q. What treatment is proper to acute or phlegmonous abscesses?

A. Warm fomentations and emollient poultices frequently renewed. If the abscess be small, situated superficially, or at a distance from important parts, it should be allowed to burst of itself.

Q. What effects have poultices in cases of suppuration?

A. They have no power in accelerating the suppurative process; but they allay pain, diminish inflammation, and keep the parts moist and easy.

Q. In what cases is it necessary to open acute abscesses?

A. When they are large, or when they are situated within the cranium, abdomen, thorax, or a joint; or in parts where the matter is likely to escape into these cavities, or to spread over a large extent of surface, as in the fore part of the neck, in the axilla, or near the rectum; or when they are deep-seated, under the periosteum, muscles, ligamentous, or tendinous expansions.

Q. When it is necessary to open an abscess, at what part of it should the opening be made?

A. At its most depending point, where this can be safely or readily done; where it cannot, in consequence of great thickness of parts between the matter and skin, at its most prominent or pointed part.

Q. If the pointing be at the upper part of the abscess, is it more prudent to open it by art, or allow it to burst by ulceration?

A. Under these circumstances, the best surgical writers recommend the abscess to open spontaneously, and the orifice to be afterwards dilated by art, as much as necessity may require.

Q. By what methods are abscesses opened?

A. Either by incision or caustic; the former of which is generally to be preferred.

Q. In what cases would you consider the latter necessary?

A. Where a considerable portion of skin has been much distended, and its structure destroyed by the magnitude of the abscess, and when there is any induration of the part.

Q. What dressings are to be applied to opened abscesses?

A. If the abscess has burst spontaneously, a poultice should be applied to it; if it has been opened by a lancet, a piece of oiled lint must be inserted between the lips of the wound, and a poultice laid over all.

Chronic Abscess.

Q. What are the symptoms of chronic abscess?

A. As the formation of chronic abscess is seldom or never attended with any apparent disorder, either of the part itself, or of the constitution, we are scarcely ever aware of its existence, until it begins to approach the surface and to form an external tumour.

Q. What appearance has the pus of chronic abscesses?

A. It is thin and serous, and contains substances resembling curds.

Q. Explain the difference between acute and chronic abscess?

A. *Acute* abscess is quickly formed; its progress rapid, and it is the consequence of acute and healthy inflammation. *Chronic* abscess is slow in its formation, tardy in its progress, and the result of chronic or unhealthy inflammation.

Q. How would you treat chronic abscess?

A. All chronic abscesses should be opened as soon as their existence is ascertained; the opening into them should be small, oblique, and made by a lancet; after the matter is evacuated, the incision should be healed by the first intention.

Q. At what part would you puncture a chronic abscess?

A. Near its base, or at a distance from the part where the matter threatens to be discharged spontaneously; because as it is a principal object to prevent the ingress of the air into chronic abscesses, which always irritates and inflames their cyst, the puncture should be made at that part of the tumour in which adhesion of the lips of the wound may be insured as speedily as possible.

Q. When the matter again collects, what plan of practice would you pursue?

A. Before it has accumulated in any considerable quantity, the sac should be opened a second time, and the pus allowed to escape; and this operation should be repeated again and again, until the disease is removed; the obliteration of the sac is accelerated by compress and bandage.

Q. Have any other means been recommended to disperse chronic abscess?

A. Yes; emetics, blisters, issues, and electricity.

Q. Whether are acute, or chronic abscesses the most dangerous; and which the most difficult to cure?

A. Chronic abscesses.

Q. Why are they most dangerous?

A. Because, whether opened by art, or allowed to burst spontaneously, their cavity always inflames, which circumstance is generally followed by dreadful, and sometimes fatal disorder of the constitution.

MORTIFICATION.

Q. What is meant by mortification?

A. When any part of the body loses a great portion of its vital principle, it is said to be mortified or gangrenous.

Q. Into how many kinds is mortification divided?

A. Into two; the one, the consequence of violently excited vascular action, accompanied at the same time with loss of power; the other preceded by little or no inflammation, or the consequence of a diminished supply of blood to, or its interrupted return from a part.

Q. At what age, and in what individuals, does each kind occur?

A. The first, which is denominated acute or humid, occurs in the young and vigorous; the second, which is called dry or chronic, in the aged, weak, and intemperate.

Q. What is the difference between the terms sphacelus and gangrene?

A. The word sphacelus is used to express the complete death of any part; the word gangrene, the partial death. Parts sphacelated cannot recover; parts gangrenous may be restored.

Q. What are the symptoms of gangrene?

A. The pain, after being increased, suffers a sudden diminution; the part affected, is deprived in a great measure of its natural heat, sensibility, and firmness; becomes soft, acquires a deep red or livid colour, and is generally covered with vesications filled with serous fluid.

Q. What are the symptoms of sphacelus?

A. When a part is sphacelated it is black, cold, motionless, insensible, and emits a fetid ordour.

Q. What are the symptoms of gangrene arising from impeded circulation?

A. The part is affected with no pain, increased heat, or any symptoms of inflammation; but is at first pale, cold, and relaxed; it then becomes black, insensible, and at length perfectly destroyed.

Q. What are the constitutional symptoms of mortification?

A. Restlessness and dejection of spirits; the countenance is pale, and there is an indescribable wildness and anxiety in the looks, the pulse is weak and rapid, the breathing hurried, accompanied with cold perspirations, hiccough, and delirium.

Q. What is meant by mildew mortification?

A. That which is occasioned by eating unsound rye, or other deleterious food. The disease commences in the hands and feet, which at first are painful and uneasy, particularly at nights, but afterwards become numb, cold, and insensible; at length the mortification spreads upwards, the parts affected loose all their moisture, grow black, are without fetor, and drop off spontaneously. Mildew mortification renders the mind imbecile, and more frequently attacks males than females.

Q. What are the symptoms of dry gangrene?

A. In dry gangrene the part is withered, cold, hard, and perfectly dry; sometimes it retains the natural colour of the skin, sometimes it is livid; it gives out no offensive smell, and separates spontaneously from the living parts.

Q. Whether does phlegmon or erysipelas most frequently end in mortification?

A. Erysipelas.

Q. In what parts does gangrene most frequently follow inflammation?

A. In the skin and cellular substance; and in the stomach and intestines.

Q. What parts resist mortification tho longest?

A. The arteries.

Q. How are the causes of mortification commonly divided?

A. Into two classes; the first are the constitutional or internal, as certain unknown states of the system, poisonous, and acrid substances taken into the stomach; the second are external or local, as violent contusions, excessive inflammation, cold, fire, &c.

Q. In what cases of mortification would you prognosticate favourably?

A. When the cause of the mortification can be removed, when it is not accompanied with emphysema, when the patient's constitution is healthy, when he is not far advanced in life, when the constitutional symptoms are moderate, and, when the line of separation appears to form between the dead and living parts.

Q. How is acute mortification to be treated?

A. In the first stage, bleeding, purgatives, diaphoretics, and low diet, should be prescribed; in the second stage, nourishing diet, cordials, wine, bark, opium and mineral acids, should be administered.

Q. What circumstances are we to attend to in the abstraction of blood in mortification?

A. We may bleed freely in gangrene, if the patient be strong, young, and healthy; but should do it cautiously, if he be old, or the mortification be spreading.

Q. Can bark be recommended in every kind of mortification?

A. It is seldom or never useful in gangrene arising from external causes, or in dry gangrene, and is often injurious, if exhibited when the abdominal viscera are much disordered.

Q. Is opium an useful remedy in mortification?

A. Opium is often prescribed with great benefit in both stages of mortification; in the first conjoined with diaphoretics; in the second with bark, cordials, &c.

Q. What external applications are necessary in cases of mortification?

A. Saturnine lotions, emollient poultices, and mild ointment. The parts which are detached and loose must be removed.

Q. Are stimulating dressings improper?

A. Certainly; except in chronic gangrene, malignant carbuncle, &c.

Q. How would you treat gangrene arising from pressure?

A. Apply the fermenting poultice and solutions of opium, and frequently change the position of the patient.

Q. How is mildew mortification to be treated?

A. The general remedies are free doses of opium, and a generous diet; the local ones are mild emollient poultices.

Q. How is dry gangrene to be treated?

A. In its commencement, when no inflammation is present, topical stimulants and nutritious diet should be recommended; in its confirmed stage, it is incurable.

Q. If amputation be necessary in a case of gangrene, what must be considered before it is performed?

A. In gangrene produced from internal causes, amputation should *never* be performed until the line of separation is seen betwixt the living and the dead parts; but in that arising from external causes, it may be undertaken without waiting for this change.

Q. Does hemorrhage follow the separation of mortified parts from the body?

A. Never.

Q. Can you explain the reason of this?

A. The arteries leading to gangrenous parts are impervious in consequence of adhesion of their internal surface, and the blood within them is coagulated for some distance.

Q. Then in amputation of a mortified limb, is no tourniquet necessary?

A. Certainly not; even although the living parts be completely divided with the knife.

WOUNDS.

Q. How have surgical writers divided wounds?

A. Into incised, lacerated and contused, punctured, poisoned, and gunshot wounds.

Q. Has any other arrangement of wounds been made?

A. Yes; besides the above, there is another, which divides them into those of the head, throat, thorax and abdomen.

Q. What is the immediate consequence and danger of every kind of wound?

A. Hemorrhage; which cæteris paribus is more profuse in incised than in contused wounds.

Q. Which kind of wounds, generally speaking, may be considered the least dangerous?

A. Incised wounds.

Incised Wounds.

Q. What is meant by an incised wound?

A. One which has been caused by any sharp cutting instrument, as a sword, razor, &c. and is not attended with any contusion or laceration of parts.

Q. What indication is first to be fulfilled in a case of incised wound?

A. To put a stop to the hemorrhage.

Q. By what means do you check traumatic hemorrhage?

A. By the tourniquet, by compression, by the ligature, by astringents, or by the actual cautery.

Q. How do you distinguish arterial from venous hemorrhage?

A. In the following manner; blood issues from a wounded artery very rapidly, in jets, and is of a bright vermilion colour, while it flows from a vein in a smooth uninterrupted stream, and presents a dark purple appearance.

Q. Whether are wounds of the arteries or veins more dangerous?

A. For the most part those of the arteries.

Q. Are surgical means always necessary for suppressing hemorrhage?

A. By no means; when the injured vessels are not above a certain size, they spontaneously cease to bleed.

Q. Explain in what way nature stops the flow of blood from a divided artery?

A. When an artery is divided it immediately discharges its blood, retracts within its sheath, becoming at the same time contracted at its truncated extremity; the blood is extravasated into the cellular substance that connects the artery to its enclosing sheath, which is left rough and lacerated upon its internal surface, where the blood readily forms a coagulum that plugs up the mouth of the vessel.

Q. What else is observed to take place?

A. When the artery is divided at a distance from any lateral branch, but not otherwise, a clot of blood of a conical form is found within the caliber of the artery itself; this has been called the internal coagulum; its base is opposed to the one above mentioned, which is named the external coagulum.

Q. What other circumstances happen to insure the permanent suppression of hemorrhage?

A. The cut extremity of the artery inflames, coagulable lymph is poured out from its serous coat, which becoming organized, perminently unites the two sides of the cavity of the vessel together, and thus renders its channel completely impervious.

Q. What occurs when an artery is partially divided?

A. The blood is effused between the artery and its sheath for several inches, both above and below the wound; after a short time it coagulates, and being firmly pressed down by the superjacent parts upon the puncture in the vessel, soon stops the hemorrhage.

Q. In what cases of hemorrhage would you apply the actual cautery?

A. In those within the mouth, and sometimes in those arising from fungous tumours, which styptics or compression fail to suppress.

Q. In what cases of hemorrhage would you apply astringents?

A. In those arising from slight superficial wounds; in those from a number of small invisible arteries; and in those from diseased surfaces when the vessels have lost their tone and contractile power.

Q. Enumerate the principal astringents?

A. Alkohol, the mineral acids, alum, agaric, &c.

Q. In what cases is compression to be used?

A. In wounds of the veins, also, when the bleeding is from many small arteries, and not from any particular one; when it is from a vessel running immediately over a bone; when it arises from vessels situated too deeply, for the convenient application of the ligature, as those behind the angle of the jaw, the plantar, the palmar and alveolar arteries.

Q. In what way would you apply compression?

A. If an artery has been punctured, a tourniquet should immediately be applied round the limb to arrest the current of blood; the external wound must then be closed, and a graduated compress firmly bound by a bandage over the site of the opening in the artery.

Q. Is this the only mode of applying compression?

A. No; in some cases you take a piece of sponge dipped in bee's wax and stiffened, and push it down upon the bleeding vessels; upon this you lay compresses of lint, and then bind the whole down by a roller.

Q. In what cases can the tourniquet be applied?

A. It is had recourse to in all considerable hemorrhages from the arteries of the extremities; it is a very simple and effectual, though only a temporary means of suppressing them.

Q. When is the application of ligatures proper?

A. When the hemorrhage proceeds from a large artery.

Q. Explain the manner in which they are applied?

A. When the wounded vessel is very large it must be seized by the forceps, when of a moderate size by the tenaculum, and pulled out or raised a little from its connexions; the ligature is then to be put round it and tied on a firm knot, care being taken not to include a nerve, vein, or much flesh; one half of the ligature is then to be cut off, while the other is left hanging from the wound.

Q. Should both ends of the ligature ever be cut away?

A. Some skilful surgeons have recommended this plan; others of equal celebrity have greatly reprobated it.

Q. What effect has a ligature on an artery?

A. It compresses its sides, divides its muscular and serous coats, causes its cavity to inflame, and at length to become permanently obliterated.

Q. What kind of ligatures are to be preferred?

A. Round, small, and firm ones; their size of course varying a little in proportion to that of the artery.

Q. On what day does the ligature generally come away?

A. From moderately sized arteries, on the seventh; from large ones, on the twelfth or fourteenth.

Q. When the hemorrhage in incised wounds is stopped, what is the next step to be taken?

A. Remove all extraneous matter, as coagulated blood, pieces of glass, sand, &c. from the wound; then relax the muscles, and preserve the parts in an easy position, and lastly, keep the lips of the wound in accurate contact by bandages, plasters, sutures, &c.

Q. When are bandages necessary?

A. In deep incised wounds they are indispensable, and can seldom be done without even in very superficial ones. They should never be applied too tight, nor when inflammation is present.

Q. When are sutures proper?

A. When the parts cannot be preserved in contact without them; in incised wounds of old people, and in those of the face and abdomen.

Q. In what cases are they unnecessary or improper?

A. They are seldom necessary, and frequently injurious in young, vigorous, or irritable people, and very improper and dangerous when there is much inflammation about the wound.

Q. When sutures create inflammation, what treatment would you adopt?

A. Cut them out, remove all the bandages and apply warm fomentations and poultices.

Q. What other important circumstances, besides all that you have mentioned, are requisite to be attended to in cases of incised wounds?

A. The patient must be kept cool, free from anxiety or exertion, and desired to live very abstemiously. If he be strong, and sympathetic fever run high, he must be bled and briskly purged.

Q. What prognosis would you form of incised wounds?

A. When they are deep or extensive, attended with much fever or inflammation, when a large or important artery, vein, or nerve, excretory duct, the brain, any of the thorax or abdominal viscera, the trachea or œsophagus have been injured, the prognosis will be less favourable, than when they are not complicated with any of these.

Lacerated and Contused Wounds.

Q. What is peculiar to lacerated wounds ?

A. They are attended with little or no bleeding, seldom heal without suppurating, particularly if attended with much contusion, and are often followed by very violent inflammation.

Q. How would you treat lacerated wounds ?

A. Restrain the hemorrhage if there happen to be any, remove all foreign matter, as splintered bones, gravel, &c. then closely approximate all the parts you can, and keep them in their situation by plasters and position, endeavouring to unite them by the first intention ; give opium to relieve the pain ; reduce inflammation if moderate, by cold lotions ; if severe, by warm fomentations and emollient poultices, and a steady perseverance in every antiphlogistic measure.

Q. How are contused wounds to be treated ?

A. The parts must be preserved in an easy position, and large emollient poultices frequently applied to them ; if fever and inflammation supervene they must be checked by antiphlogistic means.

Q. How is ecchymosed blood to be removed ?

A. First by leeches, pressure, and cold lotions, afterwards by friction and stimulating embrocations ; if it be under the periosteum it is sometimes necessary to let it out by puncturing the membrane.

Q. What may happen in contusions of the head, thorax, or abdomen ?

A. An artery, a vein, or some of the viscera may be burst.

Q. Whether are lacerated or contused wounds the most dangerous ?

A. Contused wounds ; because the former will often heal by the first intention, the latter frequently mortify and slough.

Q. In what cases would you consider amputation necessary ?

A. When the structure of the parts is so much destroyed as to be incapable of being restored.

Q. At what period after the injury would you perform amputation?

A. Not until the patient has recovered from the shock, and before symptoms of fever and inflammation have appeared.

Punctured Wounds.

Q. What are punctured wounds?

A. Those made by pointed instruments; they seem to partake more of the nature of lacerated than incised wounds.

Q. Are they very dangerous?

A. When tetanus, or violent and extensive inflammation of the fascia is occasioned by them, which not unfrequently *happens*, they are very dangerous.

Q. What treatment would you pursue in punctured wounds?

A. First stop the hemorrhage, then carefully remove all foreign bodies, prevent fever by rest, low diet, and aperient medicines, and reduce the local inflammation by leeches, cold evaporating lotions, or warm emollient poultices.

Q. If spasmodic twitches be observed and the constitutional symptoms become severe, what practice must be adopted?

A. The patient ought to be largely bled, freely purged, have low diet, and take antimonials; the inflamed fascia at the same time being completely divided by a transverse incision.

Q. Is it ever necessary to dilate punctured wounds?

A. Never, except to tie an artery, extract extraneous irritating substances, or evacuate purulent matter.

Q. If a large artery be punctured what should be done?

A. It must be cut down upon and tied both above and below the wound; if it cannot be exposed at the wounded point, it must be secured nearer the heart, only one ligature being put round it.

Gunshot Wounds.

Q. What appearance do gunshot wounds present?

A. When a musket or cannon ball has entered or passed through a part of the body, it feels benumbed, the internal surface of the wound gangrenes and sloughs before it can heal; the circumference of its aperture is of a yellowish or livid colour, there is little bleeding or pain, unless a large artery or nerve be torn across; and the patient is on the receipt of the injury, not unfrequently attacked with shiverings, syncope, and violent symptomatic affections.

Q. What are the injuries generally produced by gunshot?

A. Contusion, the ball not penetrating the surface, but bruising the interior parts, either shattering the bones, bursting viscera or blood-vessels and causing extensive ecchymosis; a ball may carry off a limb or part of the body entirely; it may pass completely through, or it may enter and remain lodged in the substance of a part.

Q. How do you distinguish the opening at which the ball entered, from the one at which it passed out?

A. The former aperture is small and its edges are depressed; the latter is larger, less contused, and more irregular, and its edges are elevated.

Q. Are these openings always opposite to each other?

A. Not always; sometimes balls take very circuitous routes; a shot has been known when the arm was raised, to enter about the middle of the humerus, pass along the limb over the dorsal aspect of the thorax, course among the abdominal muscles, pierce the glatæi, and present at the rotular aspect of the thigh.

Q. What extraneous substances are most frequently found in gunshot wounds?

A. The ball itself, pieces of clothing and spiculæ of bone.

Q. How are gunshot wounds to be treated?

A. When fleshy parts are shot through, unaccompanied with wounded artery, viscus, joint, or shattered bone, we first remove, either with the fingers or forceps, all foreign bodies which are loose or superficial; we then apply to the lips of the wound a piece of oiled lint, and over this, cloths constantly wetted with cold water; after a few days, the application of a warm poultice is necessary, to promote the separation of the sloughs.

Q. Are incisions to be made into gunshot wounds?

A. Never; except for the purpose of tying an artery, or of extracting the ball, when this is not very deeply situated. When splinters of bone, angular shot, or other sharp irritating bodies are lodged in the wound, we must carefully cut them out.

Q. If a ball be firmly fixed in the soft parts, what would you do?

A. Extract it as speedily, but with as little irritation as possible, if it press on some important viscera, artery, or vein; if it do not, allow it to remain until loosened by suppuration, and then remove it.

Q. If a ball be lodged in a bone, how would you proceed?

A. Some eminent surgeons recommend it to be extracted without delay, either by the trephine, elevator, or bullet drawer; while others recommend it to be left alone, unless it can be removed with certainty, and by very gentle means.

Q. When a shot has passed about the situation of a large artery, what method of treatment would you adopt?

A. Apply a tourniquet loosely about the limb; should hemorrhage occur, the instrument must immediately be tightened, the artery exposed, and tied both above and below the wound.

Q. In what cases would you perform amputation?

A. When a joint is much shattered or laid open; when the soft parts are violently contused and deeply lacerated; when the principal blood-vessels or nerves with much soft parts are carried away, the bone remaining entire; when the hand or foot is cruelly torn;

when a limb is shot completely off; when there is fracture of the bone, accompanied with wound of the principal artery; when the bone is shattered, and the soft parts destroyed; when the bone is smashed, the vessels ruptured, and the muscles crushed and torn, but without any external wound; when the parts fall into gangrene; and when hectic fever and profuse or unhealthy suppuration are wasting the patient.

Q. If the gangrene be spreading, would you not defer amputation?

A. By no means; it is only in gangrene, arising from an internal cause, that we wait for the line of separation betwixt the living and dead parts, but in traumatic gangrene, we do not defer the operation, but separate the limb just above the mortified part.

Q. At what time after the injury should amputation be performed?

A. As soon as the patient has recovered from the violence of the shock.

Q. Are there any cases of wounded joints or fractured bones, in which you would endeavour to save the limb?

A. Yes; where a musket-shot has merely penetrated a joint or shattered a bone, without in either case doing any very violent injury to the soft parts.

Q. In the former example how should the patient be treated?

A. The inflammation should be subdued by frequent bleedings, by purgatives, low diet, rest, warm fomentations and poultices, and by other antiphlogistic means. When suppuration is established, nourishing diet, bark, wine, mineral, acids, &c. should be given, and opiates to procure rest.

Q. In the second example what practice would you adopt?

A. Treat the case as a bad compound fracture; lay the limb on splints, make an incision to the bone; take away the loose splinters and foreign bodies, and keep down all inflammation and febrile excitement by a diligent perseverance in antiphlogistic measures.

Q. Are gunshot wounds of the head attended with great danger?

A. Invariably; whether the ball enters the cranium or not.

Q. Why are they so dangerous?

A. If the skull be violently struck, the bone is either merely fractured, or the fracture is accompanied with depression, or it is killed by the contusion, in which case the dura mater and pericranium separate from it, and then follow inflammation and abscess of the brain. If the ball enters, it fractures and drives in the bones, and either lodges in the brain, or passes entirely through it.

Q. How are these wounds to be treated?

A. By diligently using all those means which ward off and diminish inflammation and fever, and by having recourse to the trephine, when compression of the brain or other circumstances call for it.

Q. How are gunshot wounds of the abdomen divided?

A. Into two kinds; in the first, the ball enters the cavity of the abdomen, but does no injury to the viscera: in the second, which is the most dangerous, the ball not only penetrates the parietes of the abdomen, but wounds the contained bowels.

Q. Are wounds of the abdomen less dangerous when inflicted by sharp instruments, than by gunshot?

A. They are; and this is also the case in gunshot wounds of the head.

Q. What mode of treatment must be pursued in gunshot wounds of the abdomen?

A. We practice largely both general and local bleeding, give gentle purgatives and oleaginous clysters, apply fomentations and the warm bath, and enjoin rest and rigid abstinence, extract all extraneous bodies that are within reach, return any protruded viscus, place on the wound the simplest dressings and emollient poultices, and if the bladder be wounded, we introduce along the urethra an elastic gum catheter, to prevent effusion of urine.

Q. What is the proper treatment of gunshot wounds of the chest?

A. Subdue inflammation by a copious abstraction of blood, and repeat it as often as the pain, cough, difficult respiration and hemorrhage return; remove all foreign substances that do not require much searching for; close the external wound immediately, and open it again, or make another more suitable one, if extravasation of blood within the chest, or any other causes require it; apply oiled lint and poultices to the wound, then give digitalis and antimonials, and if the cough be very troublesome, opiates: prescribing at the same time, rest and low diet.

Q. Whether are punctured, or gunshot wounds of the chest more dangerous?

A. The former; because there is a greater discharge of blood, which being poured into the chest, oppresses the lungs, fills the bronchiæ, and threatens suffocation.

Q. What course does the ball take in gunshot wounds of the thorax?

A. Sometimes it passes completely through the lungs, or sticks in their substance; sometimes it enters the chest, sweeps round the lungs without touching them, and passes out opposite to where it entered, and sometimes it runs between the pleura and muscles.

For wounds of the head, chest, and abdomen, vide p. 21.

TETANUS.

Q. What is tetanus?

A. An almost unintermitting spasmodic contraction of the voluntary muscles.

Q. By what causes is it produced?

A. By cold suddenly succeeding heat; by ligatures twitching the nerves; by lacerated, punctured, or gunshot wounds, more particularly those of the extremities.

Q. At what time after the accident does it generally appear?

A. About the fourteenth or twentieth day.

Q. Into how many kinds is tetanus divided?

A. Into idiopathic and traumatic, acute and chronic.

Q. What are the symptoms of traumatic tetanus?

A. Pain and inflammation in the wound, followed by rigidity of the muscles of the neck and lower jaw, extending to the back, and then to the arms, afterwards to the abdominal muscles, and lastly to those of the sacral extremities; severe pain at the scrobiculus cordis, impeded respiration, small pulse, pale countenance, high coloured urine, and constipated bowels.

Q. What is the disease called when it affects only the lower jaw?

A. It is called trismus.

Q. What is the meaning of emprosthotonos, opisthotonos, and pleurosthotonos?

A. Emprosthotonos is when the body is bent sternad; opisthotonos, when it is bent dorsad, which is the most common form of tetanus; and pleurosthotonos, when it is bent either dextrad or sinistrad.

Q. How is tetanus to be treated?

A. All irritating bodies are to be removed from the wound, and powerful opiate fomentations constantly applied to it; in chronic or mild cases, before any inflammation has come on, the nerve may be divided above the wound, or the member amputated; but either of these measures is useless in the acute or intense form of the disease; opium must be frequently and largely administered, conjoined with calomel, the warm bath, and strong cathartics; bleeding, blisters and salivation are recommended, and are sometimes successful.

AMPUTATION.

Q. Repeat the causes for which you would perform amputation?

A. Violent and extensive compound fracture of the thigh, particularly at the middle or proximal part; wounds, accompanied with destruction of the main artery and nerve, and dreadful contusion and laceration of the soft parts; removal of a limb by cannon shot; mortification; various diseases of the bones; tumours, cancer, fungus hæmatodes, &c.

Amputation of the Thigh.

Q. At what part of the thigh should you always endeavour to amputate?

A. As near to its distal extremity as is prudent.

Q. In what manner is the operation to be performed?

A. The patient is placed on a firmly fixed table, having his back supported by pillows and assistants, who are at the same time to secure his arms; the limb not operated upon, is to be tied at the ancle to the table; a tourniquet must next be applied round the diseased limb, kept in a half-bent position; the leg is then to be held fast by one assistant, while the thigh is to be firmly grasped by another, who draws up the integuments; the operator standing on the dextral side of the patient, makes as quickly as possible with a large amputating knife, having its edge directed obliquely proximad, an incision completely round the limb, through the integuments and fascia as far as the muscles; as soon as the skin is sufficiently retracted, he makes at its edge, another incision through the superficial and loose muscles, first through those on the rotular aspect, then those on the popliteal; after allowing these to contract, he cuts through the deep and fixed ones down to the bone. All the soft parts are now to be drawn up by a linen retractor, close to which the periosteum must be cut by a circular incision, and the bone divided by the saw. After the limb is removed, the femoral, and any other large artery, must be seized by the forceps and tied: the tourniquet is now slackened, the bleeding arteries carefully sought for and secured; the skin and muscles are next brought forward over the bone, and supported by plaster, pledgets of lint, two cross bandages, and a third rolled round the limb from above downwards; after this the stump is placed on a pillow, not too elevated.

Q. At what part of the thigh should the tourniquet be applied?

A. As high up as circumstances will allow, in order that it may prevent as little as possible, the free retraction of the divided muscles.

Q. At what part of the limb should the first incision be made in amputation of the thigh?

A. The incision through the integuments, at whatever part of the thigh we amputate, should generally be made about three inches below the point at which we purpose to divide the bone.

Q. Under what circumstances, do the integuments require to be dissected back?

A. When they have become adherent in consequence of inflammation to the subjacent parts, or when they are in an unsound state and cannot readily retract.

Q. How high should the integuments be allowed to retract, before the first layer of muscles is divided?

A. Those on the rotular or anterior aspect of the limb, should be allowed to retract three-fourths of an inch; but those on its popliteal or posterior aspect, only half an inch; because, the muscles in the latter situation, during the healing of the wound, diminish and shrivel up more than those in the former one.

Q. Whether should the line of the wound on the stump be made transverse or perpendicular?

A. When there is a deficiency of soft parts to cover the bone, the surgeon should make the line of the wound perpendicular; when this is not the case, he should make it transverse.

Q. At what time ought the first dressings and ligatures to be removed?

A. The dressings should be removed on the fifth or sixth day after the operation; the ligatures round the small arteries, if loose, should be gently drawn away on the sixth; but those round the large arteries, not until the tenth or twelfth day.

Q. What parts are cut through in amputation of the thigh?

A. The common integuments, the fascia, and the following muscles; the sartorius, the rectus femoris, the vastus internus, the vastus externus, the cruræus, the gracilis, the triceps adductor magnus, the biceps flexor cruris, the semitendinosus, and the semimembranosus, the cutaneous nerves, branch of the anterior crural nerve, the great sciatic nerve, the femoral artery and vein, and the vena saphena.

Q. If pain, inflammation and swelling attack the stump, what treatment would be necessary?

A. The plasters, bandages, &c. should be removed, and warm fomentations and emollient poultices applied in their stead.

Q. What methods should be adopted to suppress secondary hemorrhage?

A. If it be venous, and produced by tight bandages, these must be loosened; if it proceed from a large artery, the dressings must be removed, and the vessel secured; if from a number of small arteries, it may be checked by washing the stump with cold lotions. If secondary hemorrhage arise from a sloughing and unhealthy state of the stump, a piece of soft sponge should be kept constantly pressed against the surface of the wound, and the principal artery of the limb should also, in some cases, be cut down to, and tied nearer the trunk. If these two measures prove unsuccessful, the surgeon should amputate at a higher point.

Q. What should be done when the stump is attacked with spasm?

A. It should be fixed to a pillow, and opium in conjunction with gentle aperients administered.

Q. If the bone protrude from the surface of the stump, what practice should be pursued?

A. If the protrusion be not very considerable, the surgeon should allow nature to effect a cure by exfoliation; but if the projecting portion of bone be large, it should be sawed off as close to the soft parts as possible.

Q. Describe the method of performing the flap-amputation of the thigh?

A. The patient being placed, and the limb fixed as in the other operation, the femoral artery should be compressed at the groin by a steady assistant; the operator then takes his station on the outer side of the thigh, and grasping its fleshy tibial or inner part, he pushes a catling from the anterior, through to the posterior surface of the limb, close to the inner edge of the bone; he now cuts the instrument obliquely out, and forms a flap about four inches long; as soon as he has secured the femoral artery, which is divided during this part of the operation, he enters and passes out the catling at the same points as before, and carrying it along the fibular side of the femur, he makes the outer flap, corresponding in length and shape to the inner one; an assistant drawing aside the flaps, the operator places the edge of his knife at their very base, and divides the remaining soft parts attached to the bone by a circular incision; then covering the face of the stump with a retractor, he saws the bone in two, secures the bleeding vessels, places the flaps in accurate contact, and retains them by plaster and bandage.

Q. What parts are divided in forming the tibial or inner flap?

A. Part of the rectus and cruræus, the vastus internus, the sartorius, the triceps, the gracilis, the semitendinosus, the semimembranosus, and part of the biceps flexor cruris muscles, the femoral artery and vein, the saphæna vein, branch of the anterior crural nerve, and the great sciatic nerve.

Q. What parts are included in the fibular or outer flap?

A. Part of the rectus and cruræus, the vastus externus, and part of the biceps flexor cruris muscles.

Amputation at the Hip-Joint.

Q. Describe the method of performing amputation at the hip-joint?

A. The patient being laid on a firm table, with his nates hanging over its edge, and the limb held by an assistant, while the femoral artery is compressed at the groin, the surgeon takes a long bladed catling, and placing its point an inch below, and somewhat on the mesial or inner side of the superior anterior spinous process of the ilium, he pushes it down to the head of the femur; then passing the instrument close to the outer side of the bone, he forces it onwards, and completely transfixes the limb; he now cuts fibulad or outwards for about an inch, to get round the trochanter major, which as soon as he has done, he carries the catling obliquely downwards, towards the knee, and separates the muscles from the outer side of the bone, so as to form a flap three or four inches in length; he now ties the femoral artery and likewise the profunda. Then entering and passing out the catling at the same points as before, he forms the inner and smaller flap, by cutting the muscles at the upper and inner part of the thigh. The limb is now to be abducted, the capsular ligament laid open at its anterior and inner part, the head of the thigh bone dislocated, and the ligamentum teres divided. As soon as the limb is removed the remaining blood-vessels must be tied, the flaps put in accurate apposition, and secured by plaster and bandage.

Q. What muscles are divided in making the outer flap?

A. The sartorius, the rectus femoris, the tensor vaginæ femoris, the three glutæi, the obturator internus, the pyriformis, the gemini, and part of the vastus externus.

Q. What muscles are divided in forming the *inner* flap?

A. The iliacus internus, the psoas magnus, the obturator externus, the pectinalis, the triceps adductor femoris, the quadratus femoris, the biceps flexor cruris, the semi-tendinosus, the semimembranosus, and the gracilis.

Q. What arteries, veins and nerves are divided in amputation at the hip-joint?

A. The femoral artery, and branches from the glutæal, ischiatic, and obturator arteries; the femoral vein; the sciatic and crural nerves, and branches of the obturator nerve.

Amputation of the Leg.

Q. Describe the manner of amputating the leg four inches below the patella?

A. A tourniquet being applied over the femoral artery just where it perforates the triceps muscle, and the patient and limb placed as in amputation of the thigh, a circular incision round the leg should be made through the skin and cellular substance six inches below the patella. These parts are now to be dissected back and drawn upwards for about two inches, especially at the fore part of the limb. The surgeon then applying the edge of his knife close to the base of the reflected integuments and inclining it obliquely upwards towards the trunk, he cuts through the fascia and muscles quite down to the bone. The flap thus formed being held aside by an assistant, the interosseous ligament and parts attached to it should be divided by a catling; a retractor should then be put between the tibia and fibula over the face of the stump, and the bones sawed across; the arteries are next to be secured, the tourniquet slackened, the soft parts brought over the bones and the wound closed in a vertical direction.

Q. What arteries require to be tied in this operation?

A. The anterior and posterior tibial, the fibular, and sometimes one or two others.

Q. Mention the different parts which are divided in amputating the leg four inches below the patella?

A. The arteries above mentioned; the anterior and posterior tibial veins and nerves; the fibular vein and nerve; the venæ saphenæ; the nervus saphenus; and the following muscles, the tibialis anticus, the extensor longus digitorum pedis; the peroneus longus; the peroneus brevis and the extensor longus pollicis pedis; the gastrocnemius externus, the plantaris, the soleus, the tibialis posticus, the flexor longus digitorum pedis, and the flexor longus pollicis pedis.

Q. Describe the method of amputating the leg a little below the tuberosity of the tibia?

A. The limb being properly supported by two assistants, and the tourniquet applied as in the other operation, the surgeon divides the integuments by a circular incision carried round the leg a short distance below the tuberosity of the tibia. He then dissects the integuments back for about two inches, and close to where the skin still adheres, he divides the muscles quite down to the bones. This done, he cuts asunder by means of catling, the soft parts between the tibia and fibula ; then applying a retractor he saws the bones in two, just below the insertion of the ligament of the patella. As soon as the limb is removed, the fibula should be detached from its articulation with the tibia, the vessels tied, the nerves shortened if necessary and the bones covered by the soft parts.

Q. What arteries require to be tied in this operation ?

A. The anterior and posterior tibial.

Q. What muscles are cut through in amputating the leg just below the tuberosity of the tibia ?

A. Those situated on the anterior part of the leg are the tibialis anticus, the extensor longus digitorum and the peroneus longus ; those on the posterior part are the gastrocnemius externus, the plantaris, the popliteus, the soleus, and the tibialis posticus.

Q. Describe the manner of removing the leg by the flap amputation ?

A. A tourniquet being applied round the thigh, the knee extended and the limb steadily fixed by two assistants ; the operator makes an incision through the integuments across the fore part of the leg four inches in length. He then pushes a long bladed catling close to the posterior surface of the tibia and fibula, from the inner to the outer extremity of this incision. After having thus transfixed the lower part of the calf of the leg, he cuts downwards towards the heel, forming a flap from the gastrocnemii muscles three or four inches long. The flap being held back, he divides the remaining muscles and interosseous ligament ; he then passes a retractor over the surface of the stump and saws the bones in two exactly over the point where the catling was first introduced. The three principal arteries of the leg and any large muscular one are now to be tied, the large crural nerve is to be dissected out and the flap secured by sutures and bandage.

Amputation of part of the Foot.

Q. Describe the method of performing amputation of part of the foot?

A. A tourniquet being applied round the thigh and the patient's leg supported by an assistant, the surgeon lays hold of the foot with his left hand, and feeling the little eminence on the outer side of the os cuboides, and that on the inner side of the os naviculare, he carries an incision between these two points through the integuments across the instep, two inches before the ancle joint. He then makes a small longitudinal incision on each side of the foot, commencing at the extremities of the first incision, and extending backwards towards the heel. He now dissects back the integuments from the subjacent parts for about half an inch, and after dividing the ligaments between the astragalus and os naviculare, he bends the foot somewhat fibulad or outwards, and then cuts through those connecting the os calcis to the os cuboides. This done, he separates the muscles and other soft parts from the plantar or lower surface of the tarsal and metatarsal bones, and forms a flap long enough to cover the exposed articular surfaces of the astragalus and os calcis. The anterior tibial and two plantar arteries are now to be tied, and the flap secured by plasters and bandage.

Q. What parts are divided in this operation?

A. The integuments, fascia and ligaments; the extensors and flexors of the toes; the tendons of the tibialis anticus and tibialis posticus; the peroneus longus; the peroneus brevis; the adductor and abductor pollicis and the abductor minimi digiti muscles; the anterior tibial artery, vein, and nerve; the two plantar arteries, veins and nerves, and the venæ saphenæ.

Q. Describe the manner of removing the metatarsal bones?

A. A tourniquet being applied round the thigh and the leg steadily supported by an assistant, the operator divides the integuments on the dorsum pedis by a transverse cut, half an inch before the junction of the tarsal and metatarsal bones. From each extremity of this incision he continues a small longitudinal one forwards as far as the root of the toes. Then turning back the integuments, and dividing the ligaments connecting the tarsus and metatarsus, he cuts the soft parts forming the sole of the foot away from the bones. The metatarsus along with the toes now being removed, he saws off the projecting extremity of the inner os cuneiforme, loosens the tourniquet, applies the flap to the surfaces of the bones, and secures it by plaster and bandage.

Amputation at the Shoulder-Joint.

Q. Describe the method of amputating the arm at the shoulder-joint?

A. The patient being conveniently seated, the subclavian artery compressed by an assistant as it passes over the first rib, and the limb held horizontally; the operator makes a longitudinal incision on the anterior border of the deltoid muscle, and another on its posterior border. The lower extremities of these two incisions he then connects by a transverse cut, dividing the same muscle a little above its insertion. The triangular flap thus formed, he now dissects up, and while it is reflected, he lowers the arm, lays open the capsular ligament and divides the long head of the biceps; then carrying his knife in a circular direction along the ulnar or inner side of the limb, he cuts through the remaining muscles and soft parts, in which lies the axillary artery. This large vessel is immediately to be secured, and afterwards the smaller branches. The flaps are then to be laid over the glenoid cavity of the scapula and preserved in their proper situation by adhesive plaster.

Q. What parts are divided in this operation?

A. The deltoides, the biceps flexor cubiti, the supraspinatus, the infra-spinatus, the teres minor, the subscapularis, the long head of the triceps, the coraco-brachialis, the teres major, the latissimus dorsi and the pectoralis major muscles; the axillary artery with some of its branches; the axillary nerves and vein.

Q. Describe the method of removing the head of the humerus when diseased, or splintered by gunshot?

A. The arm being fixed as in amputation at the shoulder-joint, the surgeon makes a longitudinal incision down to the bone, through the middle of the deltoid muscle, extending from the acromion process nearly throughout its whole length; then desiring an assistant to separate the lips of the wound, he lays open the capsular ligament and divides the long head of the biceps, the tendons of the supra-spinatus and infra-spinatus, and those of the teres minor and subscapularis muscles. The head of the humerus is now to be elevated through the wound and sawed off, and if splintered, the fragments should be picked away. This done, the wound should be closed, and the end of the bone pushed upwards and the arm secured to the side by a bandage and supported in a sling.

Amputation of the Upper-Arm.

Q. Describe the method of performing amputation at the arm?

A. The patient being seated in a chair, or laid on a table, with his arm extended at right angles with the trunk, and supported at each extremity by two assistants, a tourniquet is to be applied as near to the shoulder as possible; the integuments now being drawn upwards and made tense, the surgeon divides them by a circular incision round the arm; then dissecting the skin and cellular substance back for about two inches, he applies the edge of his knife close to the part where they still adhere, and making a second circular incision, he divides the superficial muscles; as soon as these are retracted, he cuts through the deep seated muscles and periosteum, down to the bone; now applying a retractor to the surface of the stump, he saws the humerus in two; ties the arteries, and covers the bone with the soft parts, making the line of the wound transverse.

Q. What parts are cut in this operation?

A. The skin; the fascia; the biceps flexor cubiti; the triceps extensor cubiti; and the brachialis internus muscles; the brachial artery; the arteriæ profundæ superior and inferior; the vena basilica and the venæ comites; the musculo-cutaneus nerve; the radial, ulnar, spiral and internal cutaneous nerves.

Amputation of the Fore-Arm.

Q. Describe the method of performing amputation at the middle of the fore-arm?

A. A tourniquet being applied round the arm a little above the condyles of the humerus, the fore-arm should be supported at each extremity by two assistants and fixed in a state between pronation and supination. The integuments now being drawn upwards towards the elbow, the operator divides them by a circular incision carried round the limb, and after separating them from the subjacent parts, he turns them back for about two inches. He now places the edge of his knife at the base of the reflected skin, and cuts through the fascia and muscles down to the bones. Then dividing the interosseous ligament and other soft parts between the radius and ulna, he applies a retractor, and turning the hand quite prone, he saws the two bones across. This done, he ties the arteries, lays down the muscles and skin, and secures them by plaster and bandage.

Q. What muscles on the anterior part of the fore-arm, are divided in this operation?

A. The supinator radii longus; the flexor carpi radialis; the palmaris longus; the flexor carpi ulnaris; the flexor digitorum sublimis perforatus; the flexor longus pollicis; and the flexor digitorum profundus perforans.

Q. What muscles are divided on the posterior part of the fore-arm?

A. The extensor carpi ulnaris; the extensor digitorum communis; the extensor carpi radialis longior; the extensor carpi radialis brevior; the indicator; the extensor secundi internodii pollicis; the extensor ossis metacarpi pollicis, and the lower part of the supinator radii brevis.

Q. What other parts are divided in amputation of the fore-arm?

A. The skin; the fascia; the radial, ulnar and interosseous arteries and veins; the radial, the ulnar, the external and internal cutaneous nerves, and the superficial veins.

Q. What arteries require to be tied?

A. Four; the radial, the ulnar and the two interosseal.

Q. Describe the method of amputating the fore-arm with two flaps?

A. The tourniquet being applied a little above the condyles of the humerus, and the fore-arm held by two assistants, as in the operation just described, the surgeon introduces a catling at the inner and thenal edge of the ulna, and thrusts it close to the anterior surface of the bones directly across the fore-arm until its point appears beyond the radial or outer side of the radius; he then cuts towards the wrist forming a flap of nearly an inch in length; where the point of the catling emerged, he again introduces it, and pushing it along the anconal or posterior surface of the bones through to the ulnar or inner side of the arm, he brings it out at the place where it was first entered; he now forms the posterior flap of the same length as the other; an assistant holding the two flaps aside, the surgeon cuts the soft parts between the radius and ulna; this being finished, he applies a retractor, turns the hand to its utmost state of pronation and saws the bones across; he then secures the arteries, places the surfaces of the flaps in accurate apposition, and retains them by adhesive plaster.

Q. Describe the method of performing amputation at the wrist?

A. A tourniquet being applied above the condyles of the humerus, and the fore-arm held in a state between pronation and supination, the surgeon grasps the patient's hand, and makes a circular incision through the integuments round the wrist, beginning an inch distad or below the styloid process of the radius; the integuments now being drawn upwards towards the elbow, he dissects them back for a short distance; he then divides the tendons and ligaments, proceeding from the radial through to the ulnar side of the joint. As soon as the hand is removed, he ties the arteries and covers the exposed articular surfaces of the bones with the skin.

Q. What arteries require to be tied in this operation?

A. The radial, the ulnar, and sometimes the anterior interosseous.

Q. Describe the method of amputating the fingers from the metacarpal bones?

A. The hand being turned prone and steadily fixed by an assistant, the operator takes the finger in his left hand, and bending the joint, he places the heel of his knife on the back and lower extremity of the metacarpal bone; then lowering his hand and drawing the instrument down until it is nearly perpendicular, he makes an incision half round the finger. He now cuts upwards towards the hand, separating the integuments from the bone. As soon as he has arrived at the joint, he divides its lateral ligament and enters the capsule; then carrying his knife round the head of the phalanx, he brings it out on the other side opposite the place where he began his first incision, and thus forms two corresponding flaps. The finger being removed, the flaps are to be carefully laid down and secured by plaster and bandage.

Q. Describe the method of amputating the phalanges of the fingers?

A. The hand being firmly fixed, a longitudinal incision a quarter of an inch in length should be made on each side of the finger, commencing at the joint to be removed; at the lower extremity of these incisions a circular one is to be carried round the finger; the flaps are then to be reflected, the joint bent, and the capsular and lateral ligaments divided. If there be much hemorrhage the arteries may be tied, if not, the two flaps of skin must be immediately applied to the end of the bone.

Q. In what manner are the toes amputated?

A. In the same manner as the fingers.

INJURIES OF THE HEAD.

Q. What are the consequences of injuries done to the head?

A. Ecchymosis; extravasation of blood under the aponeurosis of the occipito-frontalis muscle; wounds of the integuments, producing inflammation, abscess, or erysipelas; concussion of the brain; fracture of the bones of the skull, with or without depression; inflammation or disease of the bones themselves or the membranes attached to them; inflammation of the brain; effusion of blood within the cavity of the cranium.

Q. If blood or pus be confined under the integuments of the cranium, what practice should be pursued?

A. The former fluid, if lodged in the cellular membrane, is readily dispersed by means of pressure, cold application and purgatives; if it lie deeper, as under the pericranium, and be in considerable quantity, occasion great pain, or seem likely to excite suppuration, it should be discharged by making an opening through the integuments. Pus, as soon as its existence is known, should be evacuated.

Q. What may bloody tumours of the scalp be mistaken for?

A. In consequence of the softness of their centre, and the hardness of their circumference, they may be mistaken for depression of a portion of the cranium.

Q. How are incised wounds of the scalp to be treated?

A. The head must be shaved, the hemorrhage suppressed, all foreign bodies removed, the detached parts whether integuments or bone carefully laid down in their natural situation, and secured by plaster and bandage; the patient at the same time must be kept cool and easy, and every other means prescribed to prevent or subdue inflammation and febrile excitement.

Q. How should lacerated wounds of the scalp be treated?

A. After having shaved off the hair, stopped the hemorrhage, and removed all extraneous matter, we should carefully approximate the lips of the wound however irregular they may be, and secure them by plaster and loose bandage; at the same time we should reduce the fever and inflammation by rest, abstinence, purgatives, cold applications or warm poultices.

Q. Why should such great care be taken to preserve every portion of injured scalp?

A. Because as the peripheral or outer table of the cranium derives its blood from the integuments that cover it, it must die and exfoliate, if these be removed.

Q. How should punctured wounds of the scalp be treated?

A. They should be closed as soon as possible, and the local inflammation subdued by cold lotions, rest, low diet and purgatives.

Q. What consequences sometimes arise from punctured wounds of the scalp?

A. Punctures of the scalp are sometimes followed by inflammation of the fascia, and sometimes by erysipelas.

Q. What treatment should be adopted when the fascia of the head is inflamed?

A. A transverse incision should be made through the inflamed fascia down to the bone, and blood-letting, active purgatives, diaphoretics, rest, abstinence, and exclusion from light and noise prescribed.

Q. What are the symptoms of erysipelas?

A. Shiverings succeeded by flushes of heat, sleepiness, wandering pains, head-ache, thirst, dry tongue, nausea and oppression at the stomach; after these symptoms, there appears in the part affected a dark shining redness, vanishing on pressure, but speedily returning as soon as the pressure is removed, accompanied with acrid heat, pungent pain and diffused swelling, upon the middle of which vesications arise about the fifth day, the fever at the same increasing; on the ninth day the fever generally subsides, and the redness is changed to a yellowish colour; when the face is attacked it swells, the features are distorted, the eye closed up and delirium supervenes.

Q. What are the terminations of erysipelas?

A. Resolution, a kind of suppuration and gangrene.

Q. What are its causes?

A. Disorder of the digestive organs, improper diet, cold and intemperance; it is sometimes epidemic, sometimes contagious.

Q. When is it considered most dangerous?

A. When it attacks the face and scalp.

Q. What is the constitutional treatment of erysipelas?

A. In severe attacks, moderate bleeding, active purgatives, diaphoretics, and low diet; in milder cases purgatives, combined with or succeeded by tonics.

Q. What is the local treatment?

A. Warm fomentations of poppy heads, soothing poultices, scarifications and powdered starch, or calamine to absorb the serous fluid; blisters have occasionally been found successful.

Concussion of the Brain.

Q. What is meant by concussion of the brain?

A. When the head or the general frame has received any very violent shock, the brain sometimes becomes affected with peculiar symptoms, which are denominated concussion.

Q. What are the symptoms of concussion?

A. The first stage is marked by insensibility, difficult respiration, pallid face, slow, weak, intermitting pulse and cold extremities; the second stage by returning sensibility, by sickness, by the extremities becoming warmer, the pulse stronger and more regular, the face redder, and the respiration more free; the third stage is characterized by great febrile excitement, acute pain in the head, quick hard pulse, intolerance of light and sound, contracted pupil, wildness of the looks, and generally delirium.

Q. What is the treatment of concussion?

A. In the first stage gentle stimulants may be given, and warmth applied to the extremities; in the second stage we bleed, give active purgatives and diaphoretics, prescribe rigid abstinence and seclusion from light and sound, apply blisters to the nape of the neck, and use unremittingly cold applications to the head; in the third stage we shave the head, and have recourse to the same plan of treatment as that laid down for the second stage, but carried to a far greater extent.

Fracture of the Cranium.

Q. What is the difference between fissure and fracture of the cranium?

A. When the breach in the bone is narrow or fine it is called a fissure, when open or wide a fracture; counter-fissure is fracture opposite the injured part.

Q. What bones of the skull are most frequently fractured?

A. Those situated on the coronal aspect.

Q. In what way are the bones of the cranium found fractured?

A. Sometimes only one, sometimes both tables are broken, and the fracture in either case may be attended or not with depression.

Q. Is fracture of the skull to be generally regarded as dangerous?

A. Yes; but not on account of the mere breach in the bone, but because the blow that has caused it may have produced violent concussion, inflammation, rupture of the vessels, and consequent compression of the brain.

Q. How is fracture of the cranium to be treated?

A. All those means which obviate inflammation are to be diligently used. The patient must be largely and repeatedly bled both from the arm and temporal artery, and have leeches applied to various parts of the head; active purgatives and antimonials must be administered, and rest, rigorous abstinence and exclusion from light and noise strongly enforced; the scalp must be closely shaved, and cloths wetted in cold lotions constantly applied to it, and blisters to the nape of the neck.

Q. If symptoms of compression appear what must be done?

A. The trephine must be applied first over the injured parts observed upon the scalp, and if relief be not obtained, then along the line of the fracture or upon the sphænoidal angle of the parietal bone.

Q. If the fractured bone were depressed would you trepan?

A. Certainly not, unless symptoms of compressed brain were present.

Q. For what purposes is the trephine used?

A. To enable us to raise depressed portions of the skull compressing the brain, or to take away spiculæ of bone irritating and inflaming this organ or its membranes, to evacuate purulent matter, extravasated blood or serum, and to remove foreign bodies or diseased pieces of the cranium.

Q. By what symptoms do you distinguish compression of the brain?

A. If it be slight the patient vomits, if severe no vomiting takes place in consequence of the extreme torpor of the stomach; the limbs are relaxed, the pupil of the eye dilated and insensible to strong light, the breathing is stertorous, the pulse slow, the fæces and urine involuntarily discharged, paralysis and sometimes convulsions.

Q. What are the causes of compression?

A. Depressed parts of both plates of the cranium or detached fragments from its central table, extravasated blood, pus, and extraneous bodies.

Q. What is the proximate cause of compression?

A. Obstructed circulation of blood in the brain, by which the nervous energy is diminished or destroyed.

Q. How do you ascertain whether compression arises from depressed bone, extravasated blood or purulent matter?

A. When from the first cause, the patient never regains his senses after the infliction of the injury; when from the second, after having for a time recovered, he again gradually sinks into a state of unconsciousness and insensibility; the last is always preceded by symptoms of inflammation within the head, and is a long time before it produces its effects.

Q. Whether is compression from depressed bone or from extravasated blood the most dangerous?

A. The latter; because it can less easily be removed than depressed bone, and owing to its diffusion it produces more extensive and serious mischief.

Q. In what parts within the cranium is blood found extravasated?

A. Between the central surface of the skull and dura mater, between this membrane and the membrana arachnoidea, in the convolutions, ventricles, or in the substance of the brain.

Q. In which of these situations is it most frequently effused and least productive of injurious consequences?

A. Betwixt the bone and dura mater, whence it can be sometimes readily and effectually removed by the operation of the trephine.

Q. Whether is blood more frequently poured out from one large artery, or from a number of small ones?

A. Generally from a number of small vessels.

Q. How do you distinguish concussion from compression?

A. This is difficult, often impossible, because the symptoms of the one bear so great a similarity to those of the other, and they frequently both exist at the same time, or those of compression arise before the patient has at all recovered from the effects of concussion.

Q. Is there no case in which you can determine whether the patient is labouring under symptoms of concussion or compression?

A. If the stupor and insensibility immediately following the shock disappear, and the patient a little time after again becomes confused, sick, drowsy, and at last insensible; it is evident that in this instance he must be suffering under compression. Some writers affirm that concussion may be known by the coldness of the extremities, by intermitting pulse and absence of stertorous breathing, but these symptoms are very fallacious.

Q. How is compression to be treated?

A. When slight, the symptoms frequently subside by bleeding, purgatives, antimonials, cold applications to the head and other antiphlogistic measures; but in severe cases in addition to every powerful depleting means, we have recourse to the trephine.

Q. If there be no external wound or depressed bone, and yet symptoms of compression, what would you do?

A. Some recommend along with the antiphlogistic means, the trephine to be applied over the middle artery of the dura mater, others are opposed to this plan, and advise only the former.

Q. What symptoms indicate an inflamed or sloughy state of the membranes of the brain, produced by contusion?

A. A few days after the accident the whole head becomes affected with pain, which seems to extend from the injured part over which there shortly arises a circumscribed puffy tumour; the body is at the same time feeble and languid, and the appetite bad, the patient has great thirst, nausea, furred dry tongue, disturbed sleep, hot skin, quick hard pulse, flushed countenance and inflamed eyes; after these symptoms violent rigours come on, and then follow delirium, vomiting, convulsions and coma.

Q. What is discovered in the dissection of such a tumour?

A. Pus or dark coloured ichor is found separating the pericranium from the bone, which is of a grey or livid appearance, and when cut does not bleed; pus is also seen lying upon the dura mater, which no longer adheres to the surface of the skull.

Q. How is such a case to be relieved?

A. The febrile symptoms at the commencement are to be subdued by bleeding, purgatives, antimonials, cold applications to the head, blisters, rest and low diet, and as soon as the existence of matter is ascertained, it must be evacuated with the trephine.

Q. Is the prognosis of wounds of the head difficult?

A. Very; a slight blow will sometimes cause the death of the bone, separation of the pericranium and dura mater, and consequent inflammation and suppuration of the brain; while from the severest injuries, in which even portions of the brain have been destroyed, patients not unfrequently recover.

Operation of the Trephine.

Q. At what parts of the head, is it advised, not to perform this operation?

A. Over the frontal sinuses, the frontal spine, the longitudinal and lateral sinuses, over the sutures, the sphænoidal angle of the parietal bones, and not lower than half an inch coronad the orbitar arches; yet in cases of emergency, the surgeon should not hesitate to perform the operation at any of these situations.

Q. May it be performed on the occipital bone?

A. Owing to the irregularities of the os occipitis and the large muscles which cover it, it is difficult but not dangerous to perform the operation of trephine at this part of the head.

Q. Describe the operation?

A. The head being properly secured and shaved, an incision in the shape of the letter T, or as like it as the form of the external wound will allow, is to be made over the injured part completely through the integuments, which are to be dissected back from the bone. Any foreign bodies or loose splinters that may appear being now removed, the central pin of the trephine is to be fixed in, and its crown applied perpendicularly to the bone; the instrument is then to be moved backwards and forwards by the hand, and as soon it has formed a groove sufficiently deep, for containing the teeth, without the aid of the central pin, the latter is to be withdrawn, lest it should perforate the skull and wound the brain. The depth of the groove must be occasionally ascertained by a probe, and the small pieces of bone cleared away; after the trephine has entered the diploe, which is known by the increased hemorrhage and soft feeling, and begins to approach the dura mater, it should be worked with greater caution; and when the bone is nearly sawed through, it may be detached by the forceps or raised by the levator, the projecting points being removed by the lenticular. As soon as the object of the operation is attained, the flaps are to be replaced as nearly as possible in their natural situation, and dressed with lint and simple ointment, over which a loose bandage may be applied.

Q. How is the trephine to be applied to remove a depressed and firmly fixed portion of the skull?

A. In such a situation on the sound cranium, as will include a part of the depressed bone and most readily loosen it.

Q. If the depressed bone be not very firmly wedged in, how would you proceed?

A. Endeavour to elevate it by the forceps or levator, but if these prove ineffectual have recourse to the trephine, and apply it entirely on the sound cranium, but so that the line of depression be included in the circle of the trepan hole.

Q. If the depressed bone cannot be raised by one perforation, what plan should be adopted?

A. The trephine should be again applied, and in such a situation as appears most suitable to disengage the bone.

Q. How would you apply the trephine in cases of fracture without depression, or in those of abscess of the dura mater with carious bone?

A. In the first case, in the line and widest part of the fracture; in the second, in the middle of the diseased portion of the cranium.

Q. How do you ascertain whether the blood be extravasated between the dura mater and skull?

A. If blood be extravasated upon the peripheral surface of the dura mater, it separates the membrane from the bone, which when cut does not bleed very freely, owing to the central plate being deprived of a great part of its circulation.

Q. How do you remove it from this situation?

A. After the cranium is perforated, a portion of the effused blood may be got away by the fingers, probe and injection of tepid water; part of what remains becomes thin by exposure to the air and flows out, and the remainder is taken up by the absorbents.

Q. In what manner do you remove extravasated blood from beneath the dura mater?

A. In this case the membrane is elevated, tense and of a dark colour. We make an opening into it by a lancet to evacuate the blood, but from its wide diffusion only a very small quantity, and that principally serum, can be brought away, and the patient generally dies.

Q. If the middle meningeal artery, longitudinal or lateral sinuses be wounded by the trephine, by what means can the hemorrhage be checked?

A. By the application of lint to the wounded point.

Q. How would you proceed in trepanning over the frontal sinuses?

A. First remove by a large trephine the peripheral plate of the cranium, and then by a smaller one perforate the central plate.

Q. What method must be pursued in performing the operation over the frontal ridge or any other irregularity of the cranium?

A. The bone must first be cut by the trephine as far as it is safe, and the rest divided by Hey's saw.

Q. How is the patient to be treated after the operation of the trephine?

A. He must be bled and well purged, live abstemiously, and avoid every excitement, lest inflammation of the dura mater and brain supervene.

Fungus Cerebri.

Q. What is fungus cerebri or encephalocele?

A. A protrusion of the brain and its membranes through a preternatural opening in the cranium.

Q. How is it produced?

A. When there is a deficiency in the bones of the cranium, whether natural or occasioned by disease, injury or the trephine; the brain by the strong pulsation of its arteries, is pushed through the opening, and elevated much above the surface of the skull.

Q. What is the appearance of fungus cerebri succeeding natural deficiency of the cranial bones?

A. Congenital encephalocele is of two descriptions; one is a soft, round, pulsating tumour, reducible by pressure, and covered by the integuments of the head; it generally appears at one of the fontanellæ, where the bones of the head are not yet completely ossified; the other is flaccid, of a reddish colour, not covered by the scalp, and in some instances not even by the dura mater.

Q. What are the symptoms of hernia cerebri arising from accident?

A. One kind composed of cerebral matter and coagulated blood of a dark colour, and covered by the pia mater, protrudes a few days after the injury through an ulcerated opening in the dura mater. The tumour enlarges as the internal hemorrhage which caused it continues, and soon bursts through the inflamed pia mater. Another kind not appearing so soon as the first, is a completely organised fungus arising from some ulcer in the brain, and is always preceded by an opening in the dura mater. It is about the size of a pigeon's egg, but sometimes much larger, of a dark grey colour, very vascular, and grows with great rapidity; often speedily springing up in a short time after it has been removed. Both species are generally accompanied with coma, and sometimes paralysis.

Q. What is supposed to be the cause of the first kind of fungus cerebri from accident?

A. Internal hemorrhage from rupture of the blood-vessels a little below the surface of the brain, by which this viscus is expanded and raised through the dura mater, and then through the aperture in the skull.

Q. How is encephalocele arising from deficient ossification of the cranium to be treated?

A. The first description by constant and moderate pressure, the second is incurable.

Q. What is the proper treatment of that following injuries of the head?

A. To evacuate the purulent matter, remove the tumour by excision and gentle pressure, and let the patient be bled, take aperients and live abstemiously.

Fungous Tumours of the Dura Mater.

Q. Give a description of fungous tumours arising from the dura mater?

A. The existence of this dreadful disease is not known until it appears externally. It then presents a soft, yielding, elastic, pulsatory swelling, very firm at its base, suffering diminution when pressed on, and if the compression be forcible, causing stupefaction and convulsions. The tumour is sometimes painful, but often it is attended with no pain; when not very large it can easily be returned within the cavity of the cranium, and the margin of the bones distinctly felt surrounding its sides.

Q. How are these tumours produced?

A. Chronic inflammation being excited by some cause or other in the vessels of the dura mater, which communicate with those of the diploe, a tumour arises, which by its pressure destroys the two tables of the cranium, but particularly the central one; when it has perforated the bone it raises up the scalp, and this in consequence of the distension, soon ulcerates. If the tumour rapidly increase while yet within the scull, it occasions stupor, sickness, and all the sypmtoms of compressed brain, but these vanish in proportion as the aperture in the bones becomes widened.

Q. In what part of the dura mater are these tumours supposed to originate ?

A. In its peripheral layer ; the central one and the piamater being quite unconnected with the disease.

Q. Are tumours of the dura mater to be considered dangerous ?

A. They are always to be regarded as very dangerous affections.

Q. Which kind are to be looked upon as the least so ?

A. Those which are firm, moveable, not painful, have a narrow base and have not caused much disease in the surrounding parts.

Q. Which may be accounted the most dangerous ?

A. Those that have a broad base, have been of long continuance and have produced disease in the brain.

Q. For what may they be mistaken ?

A. For simple tumours of the scalp, aneurisms and herniæ cerebri.

Q. In what manner are they to be treated ?

A. A crucial incision is to be made along the whole extent of the swelling, the flaps dissected back to its base, the edges of the bone to be removed by Hey's saw, and then the tumour with part of the dura mater from which it springs, to be cut entirely away. After the removal of the tumour, the patient must be treated as after the operation of the trephine.

Q. Is it ever advisable to destroy fungous tumours of the dura mater, by ligature or caustic ?

A. Never ; the practice is always reprehensible, as the application of either ligature or caustic is generally followed by inflammation of the brain and its membranes.

WOUNDS OF THE FACE.

Q. How are wounds of the face to be treated ?

A. The treatment will vary according to the kind of wound, but as it is a principal object here to prevent deformity, we must endeavour to heal as many of them as we are able by the first intention. In incised wounds we restrain the hemorrhage, remove foreign bodies and splintered bones, approximate the lips of the wound as accurately as possible, and secure them by plaster, sutures or bandage.

Q. In what cases are sutures most required?

A. In wounds of the eyelids, nose, lips and ears.

Q. If the nose or ear be cut or bitten off, what should be done?

A. The part should be replaced and kept in its proper situation by plaster and sutures.

Q. What diseases sometimes follow wounds of the eyebrows?

A. Ptosis and lagophthalmos; and injury of the supra-or-bitar nerve is not unfrequently succeeded by amaurosis.

Q. What may be the consequence of wounds of the parotid gland or duct?

A. Salivary fistula, which is an opening on the cheek continually discharging saliva, but more profusely during mastication.

Q. What is the treatment of salivary fistula?

A. If the parotid duct be recently divided, and the wound extend quite through the cheek, the sides of the opening must be placed in accurate contact, and kept closely pressed together by roller and compresses, until they unite. In this case the peripheral side of the wound heals, the central side remains open, becomes callous, and affords to the saliva a passage into the mouth, or the divided extremities of the parotid duct reunite, and the saliva again flows along its original channel.

Q. When the complaint has been of long continuance what plan must be adopted?

A. It must be remedied by the introduction of a seton, which is effected in the following manner: the surgeon putting his two fore fingers into the patient's mouth, raises the cheek from the gums, and then pushes through it a trocar basilad and centrad; withdrawing the stilette, he passes a piece of thread through the canula into the mouth; he next removes the canula, and then affixes to the thread inside the mouth a skein of silk, which is to be drawn from within outwards, but not so far as to pass entirely through the wound, the thread alone being lodged, between its peripheral lips, and the seton between its central. The external opening being closed by plaster and compresses, except where the thread hangs out, the seton, gradually made larger and larger, must be retained, until it forms a callous opening, through which the saliva may pass into the mouth. When the silk is removed, the little orifice left by the thread, must be touched by caustic, which very soon causes it to cicatrise. During the employment of these measures, the patient ought to subsist on liquids, and refrain as much as possible from mastication.

Q. Are there any other means of curing salivary fistula?

A. Yes, the two following, which are sometimes found effectual. If the saliva has some channel into the mouth, and the external fistulous orifice be small, the application of caustic will occasionally heal it; compresses and tight bandage constantly applied to the parotid gland of the diseased side, so as to cause its obliteration, have also cured the disease.

WOUNDS OF THE THROAT AND NECK.

Q. What important parts are liable to be injured in wounds of the neck?

A. The external jugular vein, the carotid and thyroideal arteries, the internal jugular vein, the par vagum, the recurrent and intercostal nerves, the larynx, the trachea, the pharynx, and æsophagus.

Q. Where is the external jugular vein situated?

A. It commences near the angle of the lower jaw, runs down the neck between the platysma myoides and sterno-cleido mastoideus muscles, crosses obliquely over the latter, then passes along its dorsal edge, and terminates in the subclavian vein, beneath the clavicle.

Q. Describe the course of the carotid arteries?

A. After having emerged from the chest, they run along the neck by the sides of the trachea, covered by the sterno-cleido-mastoidei muscles, and nearly opposite the cornu of the os hyoides, each divides into an internal and external branch. At the sacral part of the neck they lie on the sternal aspect of the trachea, but as they approach the head they incline more towards its sides, and a little previous to their division, they rest upon the longi colli and recti capitis interni majoris muscles, being covered by the platysma myoides, glands, and common integuments.

Q. Mention the situation of the internal jugular vein, the par vagum and intercostal nerves?

A. They are all included in the same sheath with the carotid artery; the jugular vein runs on the sternal and lateral part of the artery; the par vagum on its lateral and dorsal part, and the intercostal nerve on the mesial side of the par vagum.

Q. Where is the recurrent nerve situated?

A. Having emerged from the thorax, it passes along the lateral and dorsal parts of the trachea, to be distributed upon the larynx.

Q. What are the situations of the larynx, trachea and æsophagus?

A. The larynx is attached to the sacral edge of the os hyoides, and placed at the atlantal and sternal part of the neck; the trachea runs along the sternal aspect of the neck from the cricoid cartilage into the thorax, being covered sternad by the skin and cellular membrane, and laterally by the sterno-hyoidei and sterno-thyroidei muscles; the æsophagus is situated between the trachea and cervical vertibræ, and has the pharynx at its atlantal extremity.

Q. How are wounds of the external jugular veins to be treated?

A. The bleeding from these veins may be stopped, by constant and moderate pressure.

Q. Is the hemorrhage from them ever dangerous?

A. Fatal consequences have been known to arise from wounds of the external jugular veins.

Q. If the internal jugular vein be wounded, what practice would you adopt?

A. If the wound be small, attempts should be made to heal it by compress and bandage; if large, the vessel must be secured by a ligature.

Q. How are wounds of the carotid artery to be treated?

A. If the surgeon arrives before the patient expires, which rarely happens, he must instantly seize the vessel, and tie it both above and below the wounded point, taking care not to include, in the ligature, the eighth pair of nerves.

Q. Describe the wound usually made in suicide?

A. The incision is generally high up in the neck, between the os hyoides and thyroid cartilage, opening directly into the pharynx; the food and saliva escape at the wound, and the patient is affected with a troublesome cough. The lingual and superior thyroideal arteries are commonly divided, but the trunk of the carotid in consequence of its being situated, at this part of the neck, so far dorsad, is seldom injured.

Q. How should such a wound be treated?

A. After the bleeding arteries are secured, which should be done without delay, the patient must be placed for a short time upon his belly to prevent the blood trickling down into the larynx and trachea; when the oozing has ceased, he must be laid supine, the lips of the wound approximated and retained by sutures and plaster. His head must then be raised, and his chin brought forwards towards the breast, in which position it must be preserved, by the application of a bandage. In order that the patient's food may not escape at the wound and be received without his performing the act of swallowing, which would inevitably tear out the stitches and disturb the dressings, an elastic gum catheter ought to be passed through one of the nostrils and down the æsophagus, and aliment and medicines conveyed along it into the stomach. The patient must be kept quiet, and any inflammatory symptoms subdued by antiphlogistic measures.

Q. What are the symptoms produced by wounds of the larynx or trachea?

A. Hemorrhage, discharge of mucus, and emission of air from the wound, loss of speech, continual cough, difficulty of swallowing, and if the orifice be small or irregular, emphysema.

Q. In what manner are they to be treated?

A. The hemorrhage must be checked, and the lips of the wound brought into accurate contact by elevating the head and keeping the chin close upon the breast, and secured by adhesive plaster, and if requisite, by sutures. An elastic gum tube should likewise be introduced along the nose and æsophagus into the stomach, and all febrile or inflammatory symptoms checked by strict antiphlogistic means. If the troublesome cough appear to arise from inflammation, it must be appeased by bleeding; if from other causes, by demulcents and opiates.

Q. Whether are wounds of the larynx or those of the trachea most dangerous?

A. Those of the former, owing to its extreme sensibility, which renders it more liable to inflammation.

Q. Whether are longitudinal or transverse wounds of the wind-pipe more readily healed?

A. Longitudinal wounds.

Q. Are sutures generally necessary in wounds of the trachea?

A. They are seldom or never requisite, except when the tube is completely divided, and then we employ broad flat ones, taking care not to introduce them through its lining membrane, lest by so doing, we cause inflammation, and perhaps fatal consequences.

Q. How is emphysematous swelling cured?

A. By puncturing the skin and by friction.

Q. In what way are wounds of the æsophagus to be treated?

A. In wounds of this part, which are readily known by their depth, and by liquids as soon as swallowed, instantly escaping from them; we first secure any vessels that may bleed, then close the external wound and introduce an elastic gum catheter down into the stomach; prescribe low diet and quietude, and prevent inflammation by the usual means.

Q. Can the trachea and æsophagus both be cut at the same time, without the carotid arteries or internal jugular veins being wounded?

A. Yes; instances of this kind are known, and yet when the relative situation of the parts is considered, the æsophagus dorsad the trachea, the trachea between the large trunks of the carotids, and the small space that separates these vessels, particularly near their origin, it would induce us to deny, that such a circumstance could ever happen.

WOUNDS OF THE THORAX.

Q. How are wounds of the thorax divided?

A. Into the three following kinds: those which affect the skin and muscles; those which penetrate the cavity of the thorax, but do not injure the viscera; and those which not only enter the chest, but injure some or other of the contained organs.

Q. How are the first to be treated?

A. The treatment will vary, according as they come under the class of incised, lacerated, or gunshot wounds.

Q. What effects are produced by wounds, that merely penetrate the chest?

A. Impeded respiration, arising from compression of the lungs, which is produced either by the entrance of the external air, through the wound, or by the effusion of blood from the intercostal or internal mammary arteries, into the cavity of the thorax; protrusion of the lungs, emphysema and inflammation.

Q. How is hemorrhage from the intercostal artery to be stopped?

A. The best mode is to take a piece of sponge, to which a ligature is attached, and introduce it between the two ribs, so as firmly to compress the vessel; the bleeding may likewise be checked by cutting the artery across, and allowing it to retract within its sheath, or by seizing it with a tenaculum, and then securing it by a proper ligature.

Q. What plan of treatment must be pursued, in protrusion of the lungs?

A. If the protruded part be in a healthy condition and uninjured, it ought to be immediately returned; after which the wound must be closed and secured by compress and bandage; when the opening is so small as to prevent the reduction, it ought to be dilated; if the part be mortified or much contused, it must be cut off, a ligature being previously applied round its base, to guard against hemorrhage.

Q. What are the symptoms of emphysema?

A. Emphysema is characterised, by an elastic and crackling tumour, arising over the wound and soon extending to every part of the body; there is tightness and pain in the chest, the breathing is oppressed, particularly in the horizontal position, the face looks inflamed, and the pulse is weak and irregular.

Q. What kind of injuries or wounds does this affection most frequently succeed?

A. Fractures of the ribs, where the extremities of the bones have pierced and lacerated the lungs, and deep, slanting punctured and gunshot wounds of the breast.

Q. Describe the way in which it is produced?

A. If the cells of the lungs be opened, the air that entered them by the trachea, during inspiration, escapes from the wound and lodges in the chest between the pleura pulmonalis and pleura costalis; during expiration, when the cavity of the thorax is diminished, this air is compressed, but as it cannot return through the aperture in the lungs, it is forced into the breach in the pleura costalis, passes into the cellular membrane and causes emphysema.

Q. How is emphysema produced, when there is no wound in the lungs, but only in the parietes of the chest?

A. During inspiration, when the whole dimensions of the chest are increased, and the external air is passing along the trachea to expand the lungs, it rushes at the same time, through the wound into the bag of the pleura, and causes the lungs to collapse more or less; during expiration, this air is pressed out from the thorax, but if the wound be not free, part of it gets into the cellular membrane, and occasions emphysema.

Q. What is the proper treatment of emphysema?

A. To prevent the air from spreading, we puncture the skin, not only over the wounded part, but wherever the complaint has extended. If the symptoms continue unabated, a small but free opening must be carefully made into the cavity of the thorax, and after the air has been evacuated by successive efforts of expiration, the aperture should be closed, and a bandage applied round the chest; with these means we conjoin friction, and repeated venesection.

Q. What are the symptoms of extravasated blood?

A. The patient complains of great oppression, restlessness, a senso of weight on the diaphragm, difficulty of lying on the back, and pain behind the sternum when placed upon the side opposite the wound; feels easier, when his body is bent forward or laid on the wounded side; his rospiration is difficult, his pulse weak, his countenance pale and ghastly, and his extremities cold.

Q. How do you ascertain whether the extravasation is from the intercostal arteries or from the lungs?

A. It may arise from both at the same time; but when from the latter, there is bloody expectoration, very frothy and florid blood is discharged at the external wound, and air escapes from it with a hissing noise.

Q. How are the symptoms of extravasation to be relieved?

A. After bleeding has been employed, the patient should be placed on the wounded side, that the blood may run out at the aperture; if this be too small, it must be dilated; and if at the atlantal part of the chest, another ought to be made, between the sixth and seventh ribs; when the blood is coagulated, it must be broken down by the injection of warm water.

Q. What are the symptoms of inflammation of the chest?

A. When the lungs are inflamed, there is an obtuse and often wandering pain in the chest, frequent soft pulse, difficulty of breathing, particularly in the recumbent position, tumid face, and cough usually moist; when the pleura is affected, the pain is pungent, fixed, and greatly aggravated by inspiration; the pulse is hard, there is difficulty in lying on one side, and the cough is short, distressing, and generally without expectoration.

Q. In how many ways may pneumonitis terminate?

A. In four; viz. resolution, suppuration, gangrene, or effusion of serum or blood into the bronchial cells and cellular texture of the lungs, producing almost instant suffocation.

Q. What means should be had recourse to, in inflammation of the chest?

A. Copious venesection, antimonials combined with nitre and other refrigerants, purgatives, blisters, demulcents, rest, and the most rigorous abstinence; expectoration must be promoted, first by ipecachuana and antimonials, afterwards by squills, balsam of peru, gum ammoniac and seneka. In the suppurative stage, the strength ought to be supported by nutritious diet and tonic medicines.

Q. Is it not sometimes difficult to determine, whether a wound has entered the cavity of the thorax or not?

A. Great difficulty is not unfrequently experienced in ascertaining this point, although the emission of air from the wound, for the most part, indicates that the bag of the pleura has been penetrated.

Q. Is it of importance to know, if the wound extends into the chest?

A. By no means; the treatment must always be regulated by the existing symptoms, and if no urgent ones arise, officious examinations should never be employed to discover the extent of the wound.

Q. In what manner, are wounds just penetrating the thorax to be treated?

A. All foreign bodies should be removed, the wound immediately closed, the patient laid in bed with his head and shoulders elevated, and his thighs bent towards the abdomen, and inflammation obviated by copious bleeding, rest and a diligent perseverance in every antiphlogistic measure. If they be complicated with wounded intercostal artery, protrusion of the lungs or emphysema, the treatment proper for each of these must be adopted.

Q. What symptoms are produced by a wound in the lungs?

A. The patient, immediately after the injury, coughs up frothy blood, feels faint, is affected with difficulty of breathing, a sense of suffocation and dreadful anxiety; blood and air issue from the outer wound; and if it be not free, emphysema soon begins to make its appearance.

Q. What are the consequences of wounds of the lungs?

A. Extravasation of blood, both into the cavity of the chest and into the air-cells, emphysema and inflammation.

Q. What is the proper treatment of wounds of the lungs?

A. We must first have recourse to copious abstractions of blood from the arm, to diminish the internal hemorrhage; after this, extract all foreign bodies within reach, remove the extravasated blood, then close the external wound, and lay the patient in an easy posture. If the pain, cough, and dyspnæa return, we again employ venesection, and repeat it as often as necessary. Mild purges must be administered, the most rigorous abstinence prescribed, and leeches and blisters applied to the breast.

Q. When any of the great bloodvessels within the thorax are wounded, what symptoms present themselves?

A. The patient immediately faints, frothy blood is discharged at the mouth, his pulse becomes weak and hurried, his extremities cold, his face pallid and ghastly, his lips livid, and his skin covered with cold perspirations; the thorax and bronchiæ being filled with blood, respiration becomes frequent and laborious, dreadful feelings of anxiety come on, he lies struggling for a short time, and then expires.

Q. What plan of treatment is to be adopted in such a case?

A. Suffocation is so speedily produced by the internal hemorrhage, that little time is allowed for the application of any remedies, but very copious bleedings are the only means that promise relief.

Q. When suppuration and hectic fever arise from wounds of the breast, what treatment is necessary?

A. These consequences, most probably are occasioned by the lodgment of some extraneous matter within the chest, the removal of which should be effected as soon as possible, and the patient's strength supported by nutritious diet and tonic medicines.

WOUNDS OF THE ABDOMEN.

Q. How are wounds of the abdomen divided?

A. Into those, that are superficial and affect merely the skin and muscles; into those, that just penetrate the abdominal cavity, but do not injure any of its contents; and lastly into those, that not only enter the cavity, but injure some of the contained viscera.

Q. How are incised muscular wounds to be treated?

A. The lips of the wound are to be approximated by placing the patient in a suitable position, and then retained by compress and bandage; every antiphlogistic plan must be employed, in order to prevent inflammation. After the wound has cicatrised, a broad bandage should be worn for some time round the abdomen, to prevent the occurrence of hernia.

Q. How are lacerated and gunshot wounds of the abdominal parietes to be managed?

A. According to those principles already recommended for them, when situated in other parts of the body; especial care being taken, to guard against inflammation, which is sometimes apt, to extend from the surface to the peritonæum.

Q. What dangers are to be apprehended from punctured wounds of the tendons of the abdominal muscles?

A. Extensive inflammation of these parts, often followed by large collections of purulent matter.

Q. By what symptoms is the inflammation characterised?

A. By acute pain and tension of the abdomen, violent symptomatic fever, sickness, delirium, hiccough, and dreadful spasms of the whole body.

Q. What line of practise must be pursued in such a case?

A. The patient must be freely and repeatedly bled both by the lancet and leeches, while warm fomentations and poultices are kept constantly applied to the part affected. Active cathartics, antimonials, low diet, diluent beverage, and every other reducing plan ought likewise to be had recourse to, until the inflammation and fever subside. If suppuration follows, which is indicated by shiverings and the subsidence of pain, a free opening must be made and the abscess evacuated without delay.

Q. What are the effects of very violent contused wounds on the abdomen?

A. Laceration of the bloodvessels or viscera, or inflammation of some abdominal organ, frequently terminating in abscess.

Q. What treatment is to be adopted in such cases?

A. If the rupture be extensive, the patient will most probably very soon die; if slight, he may recover, and we employ blood-letting and other depleting means, to arrest the peritoneal inflammation, which effusion has produced. If inflammation be excited without extravasation, it must be subdued by the usual measures; should it continue, suppuration will be produced, the opposed surfaces of the injured organ and parietes of the abdomen will adhere, and as soon as the abscess points externally, a free opening must be made into it, and the matter discharged.

Q. Are wounds of the abdomen attended with much danger?

A. Wounds of this cavity are particularly dangerous in consequence of the injuries frequently sustained by the great bloodvessels, the vital organs, and the numerous and important nerves which it contains, and owing to the extravasation of the contents of the viscera, and the susceptibility of the peritonæum to inflammation.

Q. By what indications do you determine whether a wound has penetrated the cavity of the abdomen or not?

A. When there is excessive pain; when by the introduction of the finger through the wound, the central smooth surface of the peritonæum and the intestines can be distinctly felt; when the opening is not in the tract of the epigastric artery, and, yet much blood is discharged; when there are symptoms of internal hemorrhage; when blood is vomited or expelled by stool; when bile, feculent matter, &c. flow from the wound, we may infer, that the abdominal cavity has been entered, and some of the contained organs injured.

Q. When it is doubtful, if a wound has entered the abdomen, what plan of treatment ought to be adopted?

A. In this case, we should endeavour, by bleeding and other antiphlogistic means, to prevent peritoneal inflammation; which is one of the principal and most frequent consequences, of wounds of the abdomen.

Q. What are the symptoms of peritonitis?

A. The abdomen is tense, swollen, and so painful and tender, that even the slightest pressure cannot be endured; the patient is unable to sit erect, his pulse is small and quick, his tongue dry, and his countenance ghastly; there is great fever, restlessness, difficult respiration, and vomiting or diarrhæa.

Q. What is the proper treatment of peritonitis?

A. The patient must be copiously and repeatedly bled, and have warm fomentations and blisters applied to the abdomen; mild purgatives, diaphoretics, and oleginous clysters are to be administered, and the warm bath, low diet, and other reducing means had recourse to.

Q. How are wounds, which simply penetrate the abdomen to be treated?

A. We first remove all extraneous matter, and then place the patient in the best position to relax the muscles, and to allow us to approximate the lips of the wound, which we retain by plaster and bandage. We have recourse to copious and repeated venesection, oleaginous glysters, mild purgatives, low diet, fomentations, the warm bath, and other antiphlogistics, to subdue the fever and inflammation.

Q. Are sutures ever to be used in these cases?

A. Sutures must be employed as seldom as possible, as they generally, occasion great pain, and often peritoneal inflammation. In small longitudinal wounds, they are never necessary, but in very large or transverse ones, almost indispensable.

Q. In what way are they applied?

A. Lest the intestines should be wounded, the needle must always be entered at the peritonæum, and passed from the central through to the peripheral surface, of the abdominal parietes.

Q. What viscera, are most commonly protruded, through wounds of the abdomen?

A. The omentum and small intestines; and in large wounds, the stomach, large intestines, and sometimes the liver.

Q. When do protrusions most commonly occur?

A. When the sacral part of the abdomen is wounded.

Q. If a portion of intestine be protruded, what ought to be done?

A. It should immediately be returned in the following manner; the patient being placed upon his back, his head, shoulders and pelvis elevated, so as to relax the abdominal muscles, the surgeon gently pushes, in a perpendicular direction, the displaced bowel into the abdomen, taking care that the last protruded portion is first reduced, and the first protruded part the last reduced. Having ascertained, that the intestine is quite lodged within the abdominal cavity, he closes the wound and secures it by plaster and bandage; he then draws twenty or thirty ounces of blood from the arm, and diligently employs every antiphlogistic measure, until all symptoms of inflammation disappear.

Q. What unpleasant circumstances might happen, if the whole displaced part were returned at once, or the pressure applied obliquely?

A. From the difficulty of reduction occasioned by this unskilful management, the bowel might suffer such violent contusion, as would cause it to inflame; or it might be forced between the layers of the abdominal muscles, and become strangulated.

Q. What causes sometimes impede the reduction?

A. The smallness of the wound and distension of the bowel by air or fæces.

Q. How is the first to be remedied?

A. By enlarging the opening at its atlantal side, unless the epigastric artery or umbilical vein, which we must be careful not to injure, be situated at this part; in such case, we make the incision at the sacral edge of the wound.

Q. Describe the origin and course of the epigastric artery?

A. The epigastric artery arises from the external iliac, just as it is about to pass under Poupart's ligament. It crosses the external iliac vein, and running obliquely atlantad, it passes dorsad the spermatic cord, and mesiad the upper abdominal ring. A little above the pubes its oblique course is altered, and it runs parallel with the linea alba on the dorsal aspect of the rectus abdominis; at first lying between this muscle and the peritonæum, but afterwards between the muscle and its sheath; near the umbilicus it anastomoses with its fellow, and then with branches from the internal mammary artery.

Q. How is the second impediment to be overcome?

A. By gently, but steadily, pressing the fæces or air into the unprotruded part of the intestine. If this cannot easily be accomplished, an oleaginous enema, or one of cold water and salt, may be administered.

Q. Should punctures ever be made in the bowels, to give egress to the air?

A. This plan should on no account be adopted, for small openings in the intestines are perfectly ineffectual, as they are immediately closed by the mucous coat falling over them; and large ones never fail to excite dangerous, and not unfrequently fatal, inflammation.

Q. Whether is protruded omentum or intestine more difficult of reduction?

A. The latter, as it is for the most part distended either with air or fæces.

Q. If the displaced omentum or intestine be in an unsound condition, what practice ought to be pursued?

A. If the omentum be diseased or mortified, it must be cut off, and its bleeding vessels, if necessary, secured; if the protruded intestine be gangrenous, an incision must be made into it, to allow the fæces to escape; and if a free evacuation be not thus obtained, the stricture ought to be divided.

Q. If the protruded intestine be wounded, what treatment must be practised?

A. If the opening be very small, the loose villous coat will soon close it and prevent effusion; in this case, therefore, we apply no stitches, but restore the bowel as speedily as possible to its natural situation; if the aperture be somewhat larger, and just allowing the fæces to escape, we take hold of it by a pair of forceps, and then include it in a ligature, the extremities of which are to be cut off close to the intestine; the protrusion is next to be returned into the abdomen, the lips of the outer wound brought together by plaster and bandage, and inflammation prevented by the usual means.

Q. If the intestinal tube be nearly or completely divided, how would you proceed?

A. If the intestine be partially divided, the wound must be closed by one or more stitches according to its extent; if it be divided through its whole circumference, the separated extremities are to be joined together by four or five sutures. After the ends of the ligatures are removed, the reduction of the bowel and the closure of the external wound are next to be accomplished, and inflammation subdued by the speedy and active adoption of every antiphlogistic measure.

Q. What other circumstances are to be attended to, to accelerate the recovery?

A. The patient's body must be so placed, that the wound occupy a depending situation, to permit the feculent matter more readily to pass out; gentle aperient glysters must be frequently administered, and the food ought to be liquid, mild, and not likely to excite flatulence.

Q. If there were a large incision in an intestine, would it ever be proper to return it, without first stitching up the wound?

A. This plan may safely be adopted; for if the wounded bowel be replaced, and the opening in its coats continue for a short time, opposed to the central lips of the external wound, it becomes fixed in this situation by the adhesive inflammation; effusion is thus prevented, and the fæces are discharged through the aperture in the abdominal parietes. In time, the intestinal matter again passes along its natural channel, and the external wound heals up.

Q. Whether are longitudinal or transverse wounds of the intestines most speedily repaired?

A. The former kind.

Q. If there be no protrusion, by what indications do you ascertain, whether any viscus be injured or not?

A. Fæces, or some of the abdominal secretions, are discharged from the outer wound, blood is either ejected from the stomach or passed by stool, and to these succeed pain, tension of the abdomen, and all the symptoms of acute peritoneal inflammation.

Q. What symptoms are peculiar to wounds of the stomach, and to the large and small intestines?

A. Besides being attended with discharge of their contents, acute fever and inflammation; wounds of these parts are accompanied with fainting, weak tremulous pulse, cold extremities, horror and paleness of the countenance, great anxiety and cold perspirations. When the liver is injured, the skin assumes a yellow appearance, and is affected with the most intolerable itching.

Q. Which viscera, when wounded, are productive of the greatest danger?

A. The liver, the stomach and small intestines; wounds of the large intestines are the least perilous.

Q. Why are wounds of the small intestines, more dangerous than those of the large ones?

A. Because the former are more vascular, and their functions more important and necessary to life.

Q. Does effusion invariably follow wounds of the hollow abdominal viscera?

A. By no means; effusion only happens, when the bowel at the time of the accident is very full, and the wound in its coats, extensive or lacerated.

Q. By what contrivance of nature, is extravasation within the abdomen prevented?

A. The contraction and pressure of the abdominal muscles and diaphragm, preserve the contained viscera in close contact with the central aspect of the parietes of the abdomen, and when the cavity is penetrated, and a bowel injured, inflammation comes on in the circumference of both wounds, which are kept in accurate apposition; coagulating lymph is thrown out, the surfaces of the peritoneum, covering both the abdominal muscles and intestines, unite, and thus extravasation is effectually prevented.

Q. Which effused fluids are the most dangerous?

A. The urine and bile; next to these are the fæces, and blood is the least dangerous.

Q. How are injuries of the abdominal viscera, unaccompanied with protrusion, to be treated?

A. As the chief object is to subdue inflammation, we should have recourse to free and repeated venesection, and every other antiphlogistic plan; apply leeches and warm fomentations to the abdomen, use the warm bath, unload the bowels by oleaginous glysters, and not allow the patient to take either solid, flatulent, or large quantities of liquid food.

Q. When the bladder is penetrated, what treatment ought to be adopted?

A. Besides the employment of the strictest antiphlogistic means, an elastic gum catheter should be introduced along the urethra, and allowed to remain, until the urine has ceased to be extravasated.

Q. Is it ever prudent to evacuate, by an operation, blood effused within the abdomen?

A. Yes; when the fluid is in considerable quantity, productive of bad symptoms, and its situation can be distinctly ascertained.

DISEASES OF THE EYE.

Of the Appendages of the Eye.

Q. Enumerate the diseases most common to the appendages of the eye?

A. Psorophthalmia, purulent ophthalmia, erysipelas over the lachrymal sac, inflammation, blennorrhea, hernia, and hydrops of the lachrymal sac, obstruction of the nasal duct, epiphora, stillicidium lachrymarum, fistula lachrymalis, pterygium, encanthis, entropium, ectropium, hordeolum, ptosis, lagopthalmus, symblepharon, anchyloble pharon, encysted tumours of the eye-lids, and tumour of the lachrymal gland.

Q. What are the symptoms of psorophthalmia?

A. Inflammation and itching of the tarsal edges of the eyelids, accompanied with a morbid and acrid secretion from the meibonian glands, which, during sleep, glues the ciliary margins firmly together, and causes such irritation in them, that they at length ulcerate; the cheek is sometimes inflamed or excoriated, and when the disease has been of long standing, the eyelid becomes everted from tumefaction of its lining membrane.

Q. What are the causes of psorophthalmia?

A. Ophthalmia, cold, measles, and small pox.

Q. How is it to be treated?

A. The general remedies are aperient and alterative medicines; the local ones, in the acute stage, are warm opiate and saturnine applications; and when the disease has become chronic, a little of the unguent. nitrat. hydrarg. must be rubbed on the edges of the eye-lids every night, by means of a hair pencil.

Purulent Ophthalmia.

Q. Give a description of purulent ophthalmia?

A. The disease commences in the tunica conjunctiva, and is very sudden in its attack; when severe, it is attended with excruciating pain in the eye, the most intolerable head-ache, and high symptomatic fever. The edges of the palpebræ are red and tumefied, and separated with difficulty, the conjunctiva lining them is severely inflamed, swollen, frightfully protrudes, and at length, becomes studded with hard fleshy granulations. When the inflammation extends to the conjunctiva sclerotica, this membrane is of a pale red colour, and much thickened; the cornea appears sunk, loses its transparency, and then ulcerates; the humours of the eye flow out, and its coats collapse, or the iris protrudes, or staphyloma is produced, or the whole organ is completely destroyed. In the beginning of the disease, there is a discharge of thin whitish mucus, but as it advances, pus is poured from the eye in great profusion, and the eyelids are edematous, and appear of a dark bluish colour.

Q. What are the causes of this disease?

A. Impure atmosphere, cold, intense light, gonorrheal matter applied to the eye, and contagion.

Q. How is purulent ophthalmia to be treated?

A. In the first stage by bleeding, general and topical; by purgatives, low diet, exclusion of light, and frequent removal of the purulent matter; by injecting tepid water beneath the eye-lids; and by the constant application of warm anodyne fomentations and poultices. In the second stage by astringents, as cold solutions of the sulphate of zinc or alum, conjoined with small proportions of vin. opii.

Q. How is the ectropium to be remedied?

A. It should be removed by slowly raising the eyelid, and then drawing it quickly towards the other, and obviated by applying gentle pressure over the eye, particularly when the patient is agitated.

Q. By what means are the fleshy excrescences, on the palpebral conjunctiva, to be removed?

A. By excision, or by the application of escharotics, as solutions of sulphate of copper or nitrate of silver.

Q. What symptoms indicate a favourable, and what an unfavourable termination of this complaint?

A. If the inflammation be not severe, or be confined to the palpebral conjunctiva and meibomian glands, or if there be a copious hemorrhage from the eye, the prognosis is favourable; but when the inflammation has affected the globe of the eye, and there become very violent, and when the remedies resorted to, have failed to give relief, the prognosis may be considered unfavourable.

Egyptian Ophthalmia.

Q. What is Egyptian ophthalmia?

A. It is a species of purulent ophthalmia, accompanied with the most violent and destructive inflammation and symptomatic fever. It begins in the tunica conjunctiva of the lower eye-lid, and from thence spreads to that portion of the membrane covering the sclerotica and upper eye-lid. The parts affected, are extremely red and swollen; the pain, at the commencement of the disease is slight, but soon after becomes most agonizing, is often remittent, generally more severe in one eye than the other, and sometimes affects the head. Blood is effused into the cellular membrane, connecting the sclerotica and conjunctive tunic, producing chemosis, and there is a profuse secretion of yellow purulent matter mixed with tears. The palpebræ are distended and edematous, their edges meet and become inverted, and the inner surface of their lining conjunctiva is covered with granulations; these, when the tumefaction diminishes, evert the tarsal edges, which now appear broad and gaping. The cornea is more or less opaque, and at length ulcerates; if the ulceration be extensive, the humours of the eye escape, and its whole structure is perfectly annihilated.

Q. What are the causes of Egyptian ophthalmia?

A. The disease is epidemic, arising from a peculiar miasm existing in the atmosphere, particularly in hot marshy countries; it can also be communicated from one person to another, by the actual contact of the discharge, which is most virulent in the acute stage.

Q. What is the proper treatment of this disease?

A. The patient must first be bled from the temporal artery, until he faint, then leeches applied to the turgid conjunctiva, and blisters to the nape of the neck, or behind the ears; the bowels must be freely evacuated, and nausea or full vomiting produced by the exhibition of large doses of tartrate of antimony; the eye ought frequently to be fomented by warm anodyne lotions, while sulphuric acid is applied to the conjunctive tunic, to prevent the formation of granulations; if these excrescences have become hard, they should be removed by a pair of scissors or lunar caustic. Light must be excluded, and the severest abstinence prescribed. In the chronic stage of the disease, solutions of sulphate of zinc or acetate of lead, and the ung. nit. hyd. or red precipitate are of the greatest utility, when applied to the eye.

Q. What are the symptoms of gonorrheal ophthalmia?

A. They are precisely similar to those of the Egyptian ophthalmia.

Q. What are the causes of gonorrheal ophthalmia?

A. The disease may be occasioned, either by the sudden suppression of a discharge in the urethra, arising from venereal infection, or by the direct application of gonorrheal matter to the eyes.

Q. How is it to be treated?

A. The treatment does not vary from that of common purulent or Egyptian ophthalmia.

Q. What are the symptoms of purulent ophthalmia of new born infants?

A. They do not differ from those of common purulent ophthalmia, and are often as violent as in the Egyptian variety.

Q. What are the causes of this complaint?

A. Cold, gonorrheal matter applied to the eyes, &c.

Q. In what manner is it to be treated?

A. In the first stage, by bleeding and other antiphlogistic means; in the second, or chronic stage, astringent applications, as solutions of alum and sulphate of zinc, are to be employed. If there be any ulceration or opacity on the cornea, it must be removed by a weak solution of nit. argent, or an ointment made of the prussiate of potassa and axunge. In short, the remedies for this disease are not different from those used in the other species of purulent ophthalmia.

Erysipelas over the Lachrymal Sac.

Q. When the parts covering the lachrymal sac are affected with erysipelatous inflammation, what symptoms present themselves?

A. At the mesial angle of the eye, a slight swelling appears of a bright red colour, smooth and shining, accompanied with pain and burning heat. The swelling spreads to the cheek, forehead, and eye-lids, particularly the upper one. The puncta lachrymalia appear shrunk, and the tears flow over the cheek; if the inflammation be moderate, thin mucus is discharged from the nostril of the affected side; if severe, it extends to the lachymal sac, and the nostril is quite dry. The patient is affected with head-ache, fever, and derangement of the digestive viscera.

Q. What are the consequences of this disease?

A. When the inflammation has not been very severe, it terminates in resolution, but for the most part leaves a stillicidium lachrymarum, which, however, soon disappears as the puncta and lachrymal passages speedily regain their natural action and vigour; when the disease has been violent, it terminates in abscess, which generally bursts externally, by several small openings, and sometimes also, into the lachrymal sac.

Q. By what indications do you ascertain, whether the abscess communicates with the lachrymal sac, or not?

A. If a small probe can be introduced into the sac, and thence into the nasal duct, if there be a very large quantity of purulent matter discharged, and this sometimes mixed with mucus or tears, or if pus and mucus escape at the puncta, by applying pressure on the nasal angle of the eye, we conclude that the abscess and cavity of the lachrymal sac, have some communication with each other.

Q. What means are to be employed in this complaint?

A. In the first stage, aperients, and occasionally emetics, must be administered to restore the healthy action of the digestive organs, and cold lotions constantly applied to the affected part; if abscess form, it ought to be opened as soon as possible, lest it should burst into the lachrymal sac.

Q. If the abscess has already opened into the lachrymal sac, what plan of treatment must be adopted?

A. It should be frequently washed out by injections of warm water, and then a piece of lint, dipped in opium wine, inserted into it.

Q. If the blennorrhæa continue, what practice ought to be pursued?

A. A portion of lint, touched with ung. nitric. oxyd. hyd. must be well introduced into the external opening, and astringent collyria, combined with vin. opii. applied to the eye, and injected into the lachrymal sac. As the discharge abates the wound should be closed, when the tears usually resume their natural channel into the nose.

Inflammation of the Lachrymal Sac.

Q. What are the symptoms of inflammation of the lachrymal sac?

A. In the first stage of this complaint, a very hard, painful, red, circumscribed, bean-shaped tumour appears at the mesial angle of the eye; the inflammation and swelling generally extend to the eye-lids, and sometimes to the cheek, the puncta are closed, the absorption of the tears is interrupted, and they flow over the cheek, the nasal duct is obstructed, and the nostril of course is without moisture; the patient complains of severe head-ache, and is often affected with considerable fever; in the second stage, the tumour is increased, of a deeper red colour, soft, fluctuating, and less painful.

Q. What treatment is to be adopted in inflammation of the lachrymal sac?

A. The fever and inflammation of the first stage are to be subdued by bleeding, purgatives, low diet, and cold applications. If the tumour be likely to suppurate, emollient poultices are to be had recourse to, and when it becomes very soft and fluctuating, and a yellowish point appears on its top, it must be freely opened by a lancet.

Q. After the swelling is opened, what must be done?

A. Tepid water, and then warm diluted solutions of sub-acetate of copper or sulphate of alum, must be injected into the sac, and astringent collyria and ung. nitric. oxyd. hyd. applied to the eye. If, after the disease has subsided, the tears have no passage into the nose, one must be formed.

Blennorrhœa of the Lachrymal Sac.

Q. What are the symptoms of this disease?

A. It is characterised by a soft tumour, situated at the nasal angle of the eye, and attended with little or no pain; when pressed, a viscid matter mixed with tears is discharged through the puncta, but seldom through the nasal duct, and therefore, the nostril on the affected side, is for the most part dry; the eye is irritable, there is an abundant secretion of tears, the meibomian glands are enlarged and turgid, the conjunctiva of the palpebræ looks inflamed, and covered with a glutinous substance, which, during sleep, joins their thickened edges together.

Q. What are the causes of blennorrhæa of the lachrymal sac?

A. Inflammation of the schneiderian membrane, or a morbid affection of the meibomian glands. The disease is always aggravated in cold damp weather, and relieved during warm dry seasons.

Q. How is this disease to be treated?

A. If it be connected with the derangement of the chylopoïetic viscera, we must endeavour to correct this, by gentle cathartics and proper regimen. Twice a day the patient must be laid upon his back, and the contents of the sac evacuated either through the puncta or nasal duct, but through the latter if possible; the eye-lids then being separated, a few drops of a weak solution of oxymuriate of mercury, or of very diluted nitric acid, are to be put into the eye; after these, a little of the ung. nitrat. hyd. or sub-acet. cupri. must always be applied to the palpebral conjunctiva.

Q. What is hernia of the lachrymal sac?

A. It is a small soft tumour situated at the nasal angle of the eye, unattended with pain or redness; when slight pressure is applied to it, the mucous fluid which it contains, either regurgitates through the puncta, or flows out at the nasal duct.

Q. How is it to be treated?

A. A graduated compress is to be bound by a moderately tight bandage over the swelling, to which powerful astringent lotions, are frequently to be applied.

Q. What is hydrops of the lachrymal sac?

A. When both the lachrymal canals and nasal duct are obliterated, the mucous secretion of the lachrymal sac cannot escape, it, therefore, accumulates, and in time causes, at the mesial angle of the eye, a very hard, large, blue coloured tumour, called hydrops sacculi-lachrymalis.

Q. How is it to be treated?

A. The tumour must be opened, and the cavity of the lachrymal sac destroyed by escharotics and pressure.

Obstruction of the Nasal Duct.

Q. By what causes is the nasal duct commonly obstructed?

A. By inflammation, and thickening of its mucous membrane, by viscid matter lodging in it, or by adhesion of its sides.

Q. What are the symptoms of obstruction of the nasal duct?

A. When the nasal duct is obstructed, the lachrymal sac, owing to the mucus and tears accumulating in it, is swelled into a small yielding tumour, from which the contents can be pressed out, through the puncta; if the sac be inflamed, purulent matter is also discharged; the nostril is dry, the eye watery, and the tears fall over the cheek.

Q. If the obstruction arise from inflammation, how is it to be relieved?

A. The inflammation, in the acute stage, is to be subduced by cold applications, purgatives, and proper regimen; in the chronic stage, and when the mucous lining of the nasal duct is swollen and indurated, the lachrymal sac must be emptied in the same manner as directed above, and a weak solution of corrosive sublimate dropped into the eye, while the disordered condition of the meibomian glands and palpebral conjunctiva is removed by the application of the ung. nit. hyd. or ung. sub-acet. cupri. and astringent collyria, and by improving the general health.

Q. How is the removal of viscid matter from the nasal canal, to be accomplished?

A. By frequently injecting, with some degree of force, warm water into the lachrymal sac and nasal duct, through the lower punctum lachrymale, and by correcting the morbid state of the meibomian secretion.

Q. When these means fail, what plan is to be adopted?

A. The duct must be examined in the following manner: the patient being seated, and his head secured by an assistant, the under eye-lid is to be stretched towards the temporal angle by the thumb or fore fingers, so as to render more conspicuous the tendon of the orbicularis palpebrarum, immediately beneath which a small puncture is to be made into the lachrymal sac; through this a slender probe is to be introduced, and when it is fairly within the sac, it must be raised vertically, so that its point may enter the nasal duct, along which it must be pushed basilad, and somewhat iniad. If the instrument be stopped, it should be twirled betwixt the finger and thumb, and turned in different directions, in order that the obstacle may be overcome. When it has passed the whole length of the tube, it must be allowed to remain for a few days, then removed, and a larger one introduced. The size of the probe ought to be increased after every three or four days, until the passage is quite free, and the tears again flow into the nose. Lukewarm water, containing a small quantity of opium wine, must occasionally be injected into the lachrymal sac, to ascertain the degree of perviousness of the nasal canal, and it will be sometimes proper to wash out the puncta and lachrymal ducts, with the same mixture, by means of Anel's syringe. Cathartic and alterative medicines are diligently to be administered, and if the meibomian glands appear diseased, a little of the ung. nit. hydrarg. should be applied to the palpebral conjunctiva every night.

Q. If the nasal duct be much thickened and indurated, what remedies ought to be employed along with the above?

A. A diluted solution of oxymur. hydrarg. should be daily injected through it, from the lachrymal sac, and a small quantity of mercurial ointment rubbed on the side of the nose.

Q. When a part of the duct is obliterated, what treatment is necessary?

A. The obliterated portion must be perforated by a long small trocar. As soon as the instrument has entered the nostril, which is known by the discharge of blood, it should be withdrawn, and a blunt probe, or silver style, introduced in its stead.

Q. Is there any other mode of removing obstructions in the nasal canal?

A. Yes; the following method is not unfrequently adopted; the upper eyelid being held by the left finger and thumb, and everted near the nasal canthus, one of Anel's probes is introduced at the superior punctum, and pushed mesiad, and somewhat basilad into the lachrymal sac; the instrument now being raised nearly to a perpendicular direction, its point is made to enter the orifice of the nasal duct, along which it is carried basilad and iniad into the nose. If there be only a slight obstruction, it is overcome by withdrawing the probe a little, again pushing it on and directing it various ways. As soon as it has entered the nostril, it is pulled out, and tepid water injected at the puncta, through the whole lachrymal passages. The operation is performed once a day, the thickness of the instrument being gradually increased.

Q. Which plan of removing the obstruction is to be preferred?

A. That in which the lachrymal sac is punctured, as the frequent introduction of instruments, through the puncta and lachrymal canals, destroy their functions, and often cause them to enflame and ulcerate.

Fistula Lachrymalis.

Q. What is meant by fistula lachrymalis?

A. The first stage has already been described; it consists of a small swelling near the mesial angle of the eye, arising from an obstruction of the nasal canal, in consequence of which, the tears are not conveyed into the nose, but collect in and distend the lachrymal sac, from which, by gentle pressure, they can be made to flow out at the puncta, being mixed with mucous, and sometimes purulent matter; when the sac inflames, becomes ulcerated, and the pus, mucous, and tears, are discharged through the ulcerated opening, it constitutes the second stage of the disease, or true fistula lachrymalis.

Q. What is the treatment of fistula lachrymalis?

A. The inflammation first being subdued, by an emollient poultice and a few doses of aperient medicine, a small probe should be introduced through the fistulous orifice, and conveyed along the nasal canal into the nose; the obstructions are to be overcome, and the rest of the treatment conducted in the way already recommended.

Q. If every means fail to render the nasal duct pervious, what treatment is to be adopted?

A. A perforation must be made with a curved trocar, through the os unguis, which lies at the inial aspect of the lachrymal sac, and separates it from the cavity of the nose. The instrument should be pushed obliquely basilad to avoid injuring the superior spongy bone. As soon as the puncture is made, blood drops from the nostril, and air, frothy blood, and mucous can be expelled through the wound by blowing the nose. After the trocar is removed, a thick silver style must be introduced through the aperture, and allowed to remain, until a free and permanent passage is established between the eye and nasal cavity.

Q. What are the advantages of this operation?

A. The operation of perforating the os unguis rarely requires to be performed; it possesses no advantages, and is frequently unsuccessful, for unless the opening be made very large, it is soon closed by granulations springing up from the schneiderian membrane; sometimes it is followed, by disease and exfoliation of the bones composing the nasal duct.

Epiphora.

Q. What is meant by epiphora?

A. Epiphora is an excessive secretion of tears, which collecting on the anterior surface of the eye, render vision very indistinct.

Q. What are the causes of epiphora?

A. Extraneous bodies adhering to the ball of the eye, or lodging between it and the eye-lids, ophthalmia, and relaxation of the secreting parts of the lachrymal organs.

Q. How is it remedied?

A. By a speedy removal of the exciting cause; and, when it depends upon relaxation of those parts which secrete the tears, we have recourse to gentle stimulant and astringent applications.

Q. What disease is sometimes produced by epiphora?

A. Ectropium.

Stillicidium Lachrymarum.

Q. What is stillicidium lachrymarum?

A. When the tears are not conveyed through the puncta, or along the lachrymal passages into the nose, but accumulate on the surface of the eye, then pass over and excoriate the cheek; the disease is termed stillicidium lachrymarum.

Q. By what is the disease occasioned?

A. By loss of action, or debility of the puncta and lachrymal ducts, by inflammation of these parts, or of the lachrymal sac or nasal canal, or by contraction, and total obliteration of these passages.

Q. Which are the most frequent causes?

A. Inflammation of the lachrymal sac, and stricture or complete closure of the nasal duct.

Q. How is stillicidium lachrymarum to be treated?

A. The treatment will be varied by the cause of the complaint; relaxation of the puncta and lachrymal canals may be removed by the external application and injection of astringents; contraction, by the introduction of Anel's probes; but the perfect obliteration of these passages is incurable. Inflammation of the lachrymal sac, and the closure of the nasal duct, must be managed according to the methods already laid down.

Pterygium.

Q. What is pterygium?

A. Pterygium is a name given to a triangular shaped membranous excrescence of a reddish or grey colour, commonly arising at the mesial angle of the eye, and gradually extending towards the transparent cornea, which it sometimes completely covers.

Q. How many species of pterygium are there?

A. Four, viz. the pterygium tenue, pterygium crassum, pterygium malignum, and the pterygium pingue.

Q. Describe the characters peculiar to each?

A. The pterygium tenue is a thin, semipellucid, ash-coloured membrane, attended with no pain, and appearing to grow from the membrana semilunaris, the pterygium crassum or pannus is a very thick, fibrous mass, of a deep red or fleshy appearance, very vascular, and without pain; when the pterygium crassum becomes painful, of a vermilion colour, or variegated, disposed readily to bleed, and firmly attached to the cornea, it is called pterygium malignum; the pterygium pingue is soft, of a straw colour, not painful, generally appearing at the temporal angle of the eye, and never so diffuse as the other species of the disease.

Q. Does more than one pterygium ever appear on the same eye at once?

A. Yes; two or three are occasionally observed.

Q. Is pterygium easily distinguished from every other disease?

A. The invariable triangular figure of the excrescence, with its base upon the white of the eye, and its apex towards the pupil, the looseness of its adhesions, and the facility with which it can be raised up from the surface of the cornea, render the diagnosis of the pterygium perfectly easy.

Q. Is pterygium more frequent among the aged or young?

A. It is more frequently met with among the aged.

Q. How is this disease produced?

A. It is the consequence of violent ophthalmia, during which the serous vessels of the conjunctive tunic, covering both the sclerotica and cornea, are distended with red blood; these vessels become varicose, while the the membrane itself remains relaxed and thickened.

Q. In what does it differ from chronic varicose opthalmia?

A. In pterygium, both the sclerotic and corneal portion of the conjunctiva is affected, but chronic varicose opthalmia consists in a morbid dilatation of the veins, and tumefaction and laxity of only the former part of the membrane, and never extends to the cornea.

Q. How is pterygium to be treated?

A. It is to be removed in the following manner; the patient being properly placed, the pterygium, must be laid hold of near its apex, by a pair of small forceps: the surgeon then raising it up, separates it by means of curved scissors, from the surface of the cornea transparens, as far as the sclerotica, commencing at the extreme point of the excrescence, and dissecting towards its base. The remaining part of the triangular mass is now to be elevated, and with a portion of the adjoining relaxed conjunctiva, cut away from the eye by a transverse semicircular incision.

Q. After the diseased membrane is removed, what treatment is necessary?

A. The eye must first be well fomented with warm water, and as soon as the hemorrhage has ceased, covered with a pledget of lint, moistened with a saturnine lotion. The patient should be kept quiet, live abstemiously, and inflammation prevented by antiphlogistic means.

Encanthis.

Q. Give a description of encanthis?

A. Encanthis is a small, soft, mulberry-like tumour, arising from the caruncula lachrymalis and semilunar membrane; after it has increased to a certain size, it extends along the conjunctiva lining the eye-lids, towards the temporal canthus, and spreads also over that which covers the nasal side of the eye, which is generally in a state of constant inflammation; when large, it impedes the closure of the palpebræ at the mesial canthus, and pushing aside the puncta, prevents the absorption of the tears, and thus causes stillicidium lachrymarum.

Q. When the disease becomes cancerous, what symptoms present themselves?

A. The excrescence is of an extremely dark red colour, very hard, and attended with severe darting pain, that extends to the eye and forehead; the slightest touch causes it to bleed, at length it ulcerates, and then emits a thin fœtid discharge; the eye is watery, and the lower palpebræ commonly everted.

Q. In what way is encanthis to be removed?

A. The tumour being raised by a pair of small forceps or hook, the surgeon detaches it with a pair of curved scissors, close to its base, from all the parts to which it is connected, taking care not to cut away too much of the caruncula lachrymalis; after the operation, the eye must be washed with cold water, and in a few days the wound touched with the sulph. alum. to accelerate its cicatrization, and if any ulceration remain, it should be removed by applying to it a little lunar caustic.

Q. When the encanthis has advanced along the eyelids, what method must be adopted for its removal?

A. The following; the upper eye-lid being everted by an assistant, a deep incision, following the margin of the tarsus, is to be made into the elongation; which is then to be laid hold of by a pair of forceps, and separated throughout its whole extent, from the central aspect of the eye-lid, proceeding from the temporal towards the nasal angle of the eye. The elongated tumour on the lower eye-lid, is to be detached in a similar way. The body, or that part of the encanthis growing from the caruncula lachrymalis, semilunar fold, and conjunctiva of the eye-ball, must next be raised, and removed from its attachments by a pair of curved scissors. When the operation is finished, cold water or mild astringent collyria, ought frequently to be applied to the eye.

Q. If the disease were to return after extirpation, and assume a malignant character, what mode of practice ought to be pursued?

A. Under these circumstances, the most prudent measure would be to remove the whole eye.

Entropium.

Q. What are the symptoms of entropium?

A. In this complaint, the cartilaginous margin of the eye-lid is inverted, by which the ciliary hairs are pressed against the conjunctive tunic of the eye-ball, and excite in it pain and inflammation. When the entropium has existed some time, the eye-lids become thickened, and their integuments unusually red, the cornea turns opaque, prominent, and indurated, sometimes ulcerates, and vision is totally lost.

Q. Are the eye-lashes ever inflected, while the tarsus remains in its natural position?

A. This modification of the disease is sometimes, though rarely met with, and is by far the most difficult of cure.

Q. In which eye-lid is entropium most commonly observed?

A. In the upper; it seldom involves the whole of the tarsus, but affects only a portion of it, and that generally next the lateral canthus of the eye; occasionally the two eye-lids are affected, and sometimes the disease appears in both eyes at once.

Q. What are the causes of entropium?

A. Relaxation of the skin of the eye-lids, occasioned by previous chronic inflammation and swelling, or by the constant and improper application of warm poultices and fomentations, disease of the meibomian glands, and the cicatrices of wounds or ulcerations on the palpebral conjunctiva.

Q. How is the disease to be remedied?

A. By the following operation; the patient being seated and his head raised, the surgeon, with a pair of forceps, or his fore-finger and thumb, must elevate exactly opposite the middle of the entropium, as large a portion of the skin of the affected eye-lid, as will be sufficient, to replace the tarsus and ciliæ in their natural position; he next cuts out this fold of skin as closely to the margin of the eye-lid as possible, and then by adhesive plaster, or a small suture, approximates the lips of the wound, which is of an oval figure, having its widest part nearly in a line with the middle point of the inverted tarsus.

Q. How is inversion of the eye-lashes to be removed, unaccompanied with any change in the position of the tarsus?

A. By frequently plucking out the inflected hairs, and then washing the edges of the palpebræ with aqua ammon. or a solution of nit. argent.

Q. What causes give rise to inversion of the lower eye-lid?

A. This affection is seldom produced by the contraction of cicatrices, but generally by encysted tumours, or inflammation and thickening of that part of the conjunctiva, which passes from the eye-lid to the globe of the eye; these pushing outwards the orbitar margin of the palpebræ, the ciliary edge becomes inverted by the action of the orbicularis muscle.

Q. In what manner can entropium of the lower eye-lid be relieved?

A. If it be occasioned by inflammation, we reduce this by the usual means; when it arises from tumours or indurations of the conjunctiva, these must be cut away, and the eye-lid supported by compress and bandage.

Ectropium.

Q. What are the symptoms of ectropium?

A. In ectropium, the eye-lids are retracted, and their conjunctive tunic exposed and of a pale red colour, the eye-ball is dry and inflamed, the tears flow over the cheek, and vision is impaired; in the progress of the disease, the conjunctiva, by constant irritation, becomes thickened, fleshy, and at length indurated, and the cornea ulcerated or opaque.

Q. What are the causes of ectropium?

A. One species is occasioned by turgescence and relaxation of the conjunctiva of the eye-lids, produced by violent inflammation; the other is caused by contractions of the skin, covering or in the vicinity of the eye-lids, induced by the cicatrices of small pox pustules, burns, or wounds.

Q. In which eye-lid does the disease most commonly occur?

A. In the inferior one; and is occasionally seen in both at the same time.

Q. How is the cure of ectropium to be effected?

A. When it arises from the first cause, and the swelling of the palpebral lining is not great, the frequent application of caustic will, for the most part, remove the complaint.

Q. By what means would you remedy the more inveterate form of ectropium, produced by relaxation of the palpebral conjunctiva?

A. By cutting away, close to the orbicular muscle, the thickened and inflamed tunic of the eye-lid, with a pair of curved scissors, or small bistoury. After the operation, the eye must be washed with cold water, and the palpebræ supported by compresses and bandage. The relaxed state of the conjunctiva, should be removed by the frequent application of the ung. nit. hyd. and astringent lotions.

Q. How is ectropium, arising from contractions of the skin, to be relieved?

A. This species of the disease, although accompanied like the first, with tumefaction of the lining membrane of the eye-lid, is easily distinguished from it by the presence of the puckered scars, the confined state of the palpebræ, and the inability to extend it over the surface of the eye-ball; when not very considerable, it can be cured by the excision of the fungus swelling of the conjunctiva. As the wound heals up, the eye-lid, though somewhat shortened, will be drawn back nearly to its natural position.

Q. Describe the operation?

A. After the patient is properly seated, an incision is to be made into the swollen and protruded conjunctiva, in the direction of the edge of the tarsus; the tumour being raised by a pair of small forceps, is to be dissected from the whole of the central aspect of the palpebræ, proceeding from the ciliary, to the orbitar margin. As soon as the operation is finished, the eyelid should be restored to its proper situation, and properly secured by compresses and bandage. If inflammation supervene, it must be subdued by the usual means.

Q. When this species of eversion is very considerable, how is it to be remedied?

A. By the following method; the surgeon having properly placed his patient, cuts out from the whole breadth of the eye-lid, at a small distance from its temporal extremity, an angular portion, resembling in shape the letter V; the diseased conjunctiva is next to be detached, and when the hemorrhage has ceased, the lips of the incision must be joined by the interrupted suture. After the operation the eye-lid ought to be covered with a compress and bandage, and inflammation prevented by antiphlogistic measures.

Q. How is the ectropium, occurring in aged persons, to be removed?

A. By the frequent application of the argent. nitrat. and astringent lotions to the thickened conjunctiva, and supporting the eye-lid with compress and bandage.

Hordeolum.

Q. What is hordeolum?

A. Hordeolum is a little, hard, painful tumour, appearing on the edges of the eye-lids, but most commonly on the inferior one, and near the mesial angle; it is of a deep red colour, attended with very violent inflammation, never perfectly suppurates, but its cavity is filled with a serous bloody fluid, and a white slough of dead cellular substance.

Q. What is the cause of hordeolum?

A. It is generally occasioned by a deranged state of the digestive organs.

Q. In what manner ought it to be treated?

A. In the commencement of the disease, when it is quite superficial, by cold applications; in the more advanced state, when the inflammation has affected not only the skin but the cellular substance, by warm fomentations and anodyne poultices; as soon as the tumour becomes soft, it should be opened with a lancet, and its contents pressed out. Afterwards, astringent lotions must be frequently applied to the seat of the disease, and a little of the ung. nit. hyd. every night. During the cure, the disordered state of the chylopoiëtic viscera, is to be corrected by a course of aperient medicine, by light nourishing diet, and country air.

Q. By what means is the induration, that sometimes remains, to be cured?

A. By applying a little lunar caustic to it, until it is entirely dispersed.

Ptosis.

Q. What is ptosis?

A. Ptosis is a preternatural relaxation or falling down of the upper eye-lid, and an inability to elevate it.

Q. What are the symptoms of ptosis?

A. In this complaint the patient is unable to raise the eye-lid, in consequence of its integuments being so redundant and relaxed, as to overhang the eye, and impede the action of the levator palpebræ muscle.

Q. What are the causes of ptosis?

A. A congenital elongation of the skin of the upper eye-lid, or a relaxation of it induced by previous inflammation, tumours on the eye-lid, a paralytic state of the levator palpebræ, and spasm of the orbicularis muscle.

Q. What is the proper treatment of ptosis?

A. When the disease arises from a redundance of the integuments, it is to be removed by the following operation; the surgeon, near the coronal edge and midway between the angles of the upper eye-lid, taking hold of and elevating as much of the superfluous skin, as will allow the levator palpebræ to execute its proper functions, with a pair of curved scissors or knife cuts it out, and then closes the wound with suture, adhesive plaster and bandage.

Q. When ptosis depends on paralysis of the levator, or spasm of the orbicular muscle, what practice ought to be adopted?

A. In the former case, cold water should be frequently dashed upon the eye, and stimulating embrocations well rubbed upon the forehead and temple; electricity, the shower-bath, gentle aperient and tonic medicines must also be prescribed. In spasms of the orbicularis, blisters should be applied to the temple or behind the ear, and narcotic fomentations to the eye and its surrounding parts, antispasmodics ought to be administered, and when the affection is symptomatic, the original disease must first be removed.

Lagophthalmus.

Q. What are the symptoms of lagophthalmus, or hare eye?

A. In this disease, the surface of the eye-ball is left uncovered in consequence of an inability to close the eye-lids. The free motion of the palpebræ being interrupted, the tears are not pressed into the puncta, and there is a constant stillicidium, the eye is irritated and inflamed by dust and other extraneous matter adhering to it, and the patient can bear only a very weak light.

Q. What are the causes of this disease?

A. The most frequent are, cicatrices on the integuments of the eye-lids; it is also produced by enlargement of the eye-ball, staphyloma, and paralysis of the orbicularis muscle.

Q. What is the proper treatment of lagophthalmus?

A. When the disease depends upon paralysis, this should be relieved by blisters, electricity, embrocations, cathartic and tonic medicines; when it is occasioned by puckered cicatrices, these must be divided, the eye-lids extended, and the lips of the wound prevented from uniting, except by granulation, by means of oiled lint being inserted betwixt them.

Symblepharon.

Q. What is symblepharon?

A. Symblepharon is an adhesion of the palpebral conjunctiva to that covering the surface of the eye-ball, and occurs more frequently in the superior, than in the inferior eye-lid.

Q. What are the causes of this complaint?

A. Ulcers of the cornea, excoriations on the conjunctive tunic of the eye-ball or palpebræ.

Q. How is this disease to be relieved?

A. If the adhesions be firm, extensive, and over the whole or greater part of the cornea, the disease is incurable; but if they be loose, very partial, and at a distance from or only just on the edge of the cornea, they may be divided with a scalpel; and the reunion of their cut surfaces prevented by frequently moving the eye-lids, and introducing between them and the globe of the eye, a small probe, smeared with a little mild ointment.

Anchyloblepharon.

Q. What is anchyloblepharon?

A. It is a concretion of part or the whole of the tarsal margins of the two eye-lids.

Q. By what causes is it produced?

A. It is sometimes a congenital affection, but most commonly occasioned by excoriations, burns, or very severe opthalmies.

Q. What method is to be adopted for the removal of anchyloblepharon?

A. If there be any opacity of the cornea, no relief can be afforded by a division of the adherent parts, but, when this is not the case, we should separate with a scalpel the united ciliary edges, and fix between their cut surfaces a piece of oiled lint, until they are perfectly healed.

Encysted Tumours of the Eye-lids.

Q. What kind of encysted tumours are generally found to form upon the eye-lids?

A. The melicerous and atheromatous kind.

Q. In which, and in what part of the eye-lids are they commonly situated?

A. They are for the most part situated on the temporal side of the superior eye-lid; when immediately under the skin, they are very moveable, but when beneath the orbicularis muscle or levator palpebræ, and adhere to the conjunctiva or cartilage of the tarsus, they are more fixed.

Q. What unpleasant effects are sometimes produced by these tumours?

A. They frequently acquire such a large size as to press upon and inflame the eye-ball, and when situated on the inferior eye-lid occasionally give rise to ectropium.

Q. What is the proper treatment of encysted tumours of the eye-lids?

A. They should be extirpated according to the following plan; the tumour for a few days previous to the operation, is to be moved about to loosen its adhesions; the surgeon then seats his patient, and fixing the tumour between his left fore-finger and thumb, makes an incision through the skin, in the direction of the fibres of the orbicularis muscle; when the cyst of the tumour is fairly exposed, it must be taken hold of with a small hook and dissected out. The lips of the wound are to be brought together by adhesive plaster, over which a pledget of lint and bandage should be applied. When the tumour is covered by the orbicularis, it should be removed from the central side of the eye-lid, which must be well everted before commencing the operation.

Q. What circumstances are to be attended, in the extirpation of tumours from the eye-lids?

A. We should be careful to remove none of the integuments, as this might occasion ectropium, and when the operation is performed on the central side of the eye-lid, and the tumour adheres to the tarsus, we must never cut away any of the cartilage, lest extropium be produced.

Tumour of the Lachrymal Gland.

Q. What symptoms are produced by scirrhous enlargement of the lachrymal gland?

A. There is an obtuse pain in the situation of this organ, which extends to the temple and forehead, and becomes gradually more severe, the eye is inflamed and pushed from the socket, its motions are impeded, and vision is either greatly impaired or completely lost.

Q. How should the tumour be removed?

A. As follows; the upper eye-lid being raised, the surgeon introduces his knife beneath it, and dividing the parts covering the enlarged gland, at length brings it into view; he then pushes through it a hook, and pulling it gently towards him, cuts the diseased mass completely away from its situation. After the operation, a compress and bandage should be applied, the patient kept quiet, and inflammation prevented by the usual means.

Diseases of the Eye-Ball.

Q. Enumerate the principal diseases of the eye-ball?

A. Ophthalmia lachrymosa, ophthalmia iridis, hypopium, exophthalmia, pustules, ulceration and opacity of the cornea, staphyloma, hydrophthalmia, prolapsus of the iris, closure of the pupil, cataract, amaurosis, hemeralopia, nyctalopia, cancer, and fungus hæmatodes.

Ophthalmia Lachrymosa.

Q. What are the symptoms of ophthalmia lachrymosa, or common inflammation of the eyes?

A. In the first stage, are observed running along the sclerotic coat, a few small red vessels, which soon become so numerous as to cover the whole surface of the eye-ball, and communicate to it a light red colour; there is a copious discharge of tears, and an inability to bear the light; the eye is affected with great heat and pain, which extends to the temples, forehead, and sometimes even to the nose; the eye-lids are swollen and tender, their lining membrane is inflamed, and there is a sensation, as if particles of sand were lodged under it; the patient at the same time complains of thirst, his countenance is flushed, his skin hot and dry, he has a quick pulse, and other symptoms of fever.

Q. Describe the second stage of the disease?

A. In the second stage of lachrymose ophthalmy, the redness and swelling of the eye are increased, but there is a diminution of pain, heat, and febrile excitement; the admission of light can be borne with less inconvenience, the tears are not secreted in such abundance, and upon the ciliary edges of the eye-lids a viscid fluid collects, which during sleep glues them firmly together.

Q. What is the seat of lachrymose ophthalmy?

A. The tunica sclerotica.

Q. What are the symptoms of the acute form of lachrymose ophthalmy?

A. This form of the disease is characterized by its extreme severity. From the violence of the inflammation, the secretion of the tears is suspended; the eye-ball feels hot, extremely tense, and is affected with excruciating pain that shoots to the bottom of the orbit, and is greatly aggravated by the presence of lig..t; blood is extravasated into the cellular substance, between the sclerotica and conjunctiva, in consequence of which, the latter tunic becomes elevated, and presents red fleshy appearance, termed chemosis; the cornea seems depressed, generally turns opaque, and sometimes ulcerates, the eye-lids are inflamed and turgid, and there is violent symptomatic fever, accompanied with throbbing pain in the temples and forehead.

Q. What are the most frequent causes of the disease?

A. Cold, foreign bodies lodging on the eye, acrid exhalations, vivid rays of light, and wounds or other injuries of the eye.

Q. By what cause is the opacity in the cornea produced?

A. By the effusion of coagulating lymph, either under the conjunctive tunic, or between the layers of the cornea.

Q. How is mild lachrymose ophthalmy to be treated?

A. When very slight, it generally disappears under the use of astringent lotions, but when more severe, the following treatment must be adopted: in the first stage, after all extraneous substances irritating the eye, have been removed, warm anodyne fomentations and emollient poultices are to be kept constantly applied to the inflamed organ; blood must be taken away from the temples and the mesial angle of the eye, by means of leeches, blisters applied to the nape of the neck, or behind the ears, active cathartics administered, quietude, and low diet prescribed, and light completely excluded.

Q. What treatment does the second stage require?

A. The eye should be exposed to a warm dry air, and to as great a degree of light as it can endure without uneasiness, and frequently washed with the liquor plumbi sub-acetatis, or solutions of sulphate of zinc, or alum; a small quantity of vin. opii. may be dropped into the nasal canthus once or twice a day, and the edges of the eye-lids smeared by means of a hair pencil, with a little of the ung. nit. hyd. or ung. nitric-oxyd. hyd. every night.

Q. What plan of treatment is to be pursued in the acute form of lachrymose ophthalmy?

A. The patient should be bled to syncope, either from the temporal artery or the arm, and leeches applied to the inflamed eye itself. A large blister ought to be placed behind the ear, or on the nape of the neck, and the eye covered with an emollient poultice, and repeatedly bathed with warm anodyne fomentations, while thin cloths, wetted in cold evaporating lotions, are constantly applied to the forehead and temples. Tartrate of antimony is to be administered, so as to produce nausea or free vomiting, and the bowels well emptied by active purgatives; the patient should be confined to a dark room, and allowed only the sparest diet. When there is purulent matter in the anterior chamber of the eye, or when the eye-ball is greatly distended, and the cornea opaque; this coat may be punctured, and the aqueous humour discharged. In the second stage; the cautious admission of light, astringents, and other remedies already recommended, are to be resorted to.

Q. How is the chemosis to be removed?

A. After bleeding and other depleting measures have been employed, a piece of linen cloth, moistened with æther, should be laid over the eye, and if the conjunctiva appear much distended, it may be divided by a lancet at the edge of the cornea.

Ophthalmia Iridis.

Q. How many species of iritis are there?

A. Four, viz. idiopathic, syphilitic, rheumatic and mercurial.

Q. What are the symptoms of idiopathic inflammation of the iris?

A. Deep within the eye is first felt an obtuse pain; which becoming more violent and lancinating, extends above the eye-brow, and darts through the brain. The presence of light is intolerable, the pupil is irregularly contracted and deprived of its bright black appearance; vision is impaired, the iris thickens, its motions are diminished, and its colour changed; first in its lesser circle, which becomes darker; then in its greater, which turns green, if in health it were grey or blue; and reddish, if it had been brown or black. The vessels of the sclerotica become enlarged, of a carmine colour, and run towards the transparent cornea, over which, however, they are not continued, but form round its edge a circle, and then pass to the inflamed iris. The pupillary margin is serrated, and turned towards the crystalline lens, with the capsule of which, it, and sometimes the whole uvea contract adhesions, while coagulable lymph, in the form of a delicate grey film, closes up the pupil, and not unfrequently fills the posterior chamber. If the disease be not arrested, the iris continues to thicken, and at length adheres to the cornea, which becomes more and more opaque, or small yellowish red abscesses form between the greater and lesser circles of the iris, then burst, and discharge their contents into the anterior chamber. The disease now abates, but as the iris has lost its mobility, and the pupil is filled up by coagulable lymph, the power of sight is nearly, if not altogether, destroyed.

Q. What are the symptoms of syphilitic iritis?

A. The disease is extremely tardy in its progress, and attended with little pain; the vessels of the sclerotica are enlarged, and form a reddish copper-coloured ring round the edge of the cornea; this tunic in a short time becomes uniformly turgid, and at length affected with white-looking ulcers, which also appear upon the sclerotic coat and integuments of the eye-lids; the iris loses its original hue and power of motion, it advances towards the cornea, and one or more dusky-red excrescences spring up from its surface; the pupil is contracted, irregular, cloudy, and carried from its natural situation, towards the root of the nose; the eye is peculiarly affected by varieties of temperature; at night, a violent pain fixes in the head above the eye-brow, and the discharge of tears, intolerance of light, and uneasiness in the eye, are exasperated; but in the morning, these symptoms and the severe head-ache abate.

Q. What are the symptoms of rheumatic iritis.

A. At the commencement of the disease, the eye-ball is affected with great distension and excruciating pain, that extends to the face, temples, and side of the head, where it generally becomes more intolerable than in the eye itself; for the most part its violence is increased at night, but subsides on the approach of morning; innumerable minute ramifications of red vessels completely cover the whole surface of the sclerotica, which has somewhat of a yellowish tinge; the secretion of tears at first is interrupted, but afterwards becomes very profuse; the conjunctiva is elevated and the cornea grows opaque, while small vesicles appear upon its surface, and bursting, leave little ulcers; when the inflammation extends to the interior of the eye, the presence of light is insupportable, the iris is motionless, changes its colour, and projects towards the cornea, the pupillary margin is irregular and turned iniad towards the capsule of the lens, and a grey flake of coagulating lymph fills up the contracted pupil.

Q. What are the symptoms of mercurial iritis?

A. This affection advances but very slowly, and is accompanied with the erythema mercuriale, the pain is less severe, and the presence of light more tolerable than in the other species of ophthalmia iridis; the vessels of the conjunctive tunic are increased in size, have a dark appearance, and extend to the edge of the transparent cornea; the colour of the iris is changed, and there sometimes appears upon it a small yellow vesicle, which, if not dispersed by proper remedies, discharges its contents into the anterior chamber; the effusion of lymph is seldom considerable, and the pupil is not much contracted.

Q. What are the terminations of ophthalmia iridis?

A. Effusion or suppuration.

Q. What are the causes of ophthalmia iridis?

A. The most common cause is the operation for cataract. It is also produced by accidental wounds of the eye-ball, and the extension of acute external ophthalmy to the deeper textures of the eye. Iritis occasionally presents itself along with chronic rheumatism, gout, syphilis, and during the abuse of mercury.

Q. When is the prognosis of iritis to be considered favourable?

A. When the inflammation is not violent or extensive, but chiefly confined to the iris, corpus ciliare, and lens; when the effusion of lymph is moderate, occupying only a small portion of the pupil, and soon becoming absorbed, and, when the motions and natural colour of the iris are returning.

Q. When is it to be considered unfavourable?

A. When the inflammation has affected the vitreous humour, retina, and choroides, and diffused itself over the whole eye-ball; when internal suppuration has supervened, and pus and blood nearly fill both chambers of the eye; when coagulating lymph completely closes up the whole pupil, and the anterior chamber is obliterated; when the iris continues immoveable, and is united to the capsule of the lens, or to the inflamed and thickened cornea.

Q. How is idiopathic iritis to be treated?

A. Blood should be repeatedly and copiously abstracted from the general system, by opening the temporal artery or veins of the arm, and topically by means of leeches; the bowels should be evacuated by the free exhibition of active purgatives, and nausea excited by proper doses of tartrate of antimony. Warm anodyne fomentations ought frequently to be applied to the eye, and a large blister to the nape of the neck; with these means are to be conjoined the exclusion of light, quietude, and the most rigid abstinence.

Q. When the inflammation has somewhat subsided, and the effusion of lymph commenced, what remedies are to be had recourse to?

A. In this stage of the disease, mercury should be freely and diligently administered, in order that the system may be soon brought under the influence of its action, which will not only prevent further extravasation and counteract adhesion, but will accelerate the absorption of lymph already effused.

Q. In what manner is the mercury best employed?

A. Calomel, or pil. hydrarg. with opium, should be given internally, and the ung. hyd. mixed with the same anodyne, well rubbed on the eye-brows, until gentle ptyalism be produced.

Q. What other applications ought to be used, in the second stage of iritis?

A. The extract of belladonna, which must be rubbed on the eye-lids, or rendered thinner by an admixture of water, and dropped into the eye; it causes expansion of the pupil, by which the adhesions, especially if they be recent, are elongated or ruptured, and the power of vision, in a great measure restored.

Q. What treatment is to be adopted in syphilitic iritis?

A. Calomel, with opium and the mercurial ointment must be employed, so as to speedily affect the constitution; mild aperients should be administered, and leeches applied to the temple of the affected side; the nocturnal pains are to be relieved by covering the eye with a bag of heated bran, and rubbing well in above the eye-brow a little ung. hydrarg. mixed with opium.

Q. What plan of treatment is to be adopted in rheumatic iritis?

A. In the first stage, the eye should be repeatedly bathed with warm anodyne fomentations, the alimentary canal freely acted upon by brisk cathartics, and a large blister placed behind the ear, or on the nape of the neck; if these means fail to give relief, the aqueous humour must be evacuated and a small quantity of blood drawn from the arm, or by one or two leeches applied to the neighbourhood of the eye; after the inflammatory action has undergone some diminution, and the effusion of lymph taken place, mercury, in conjunction with opium and belladonna, in the manner already directed, ought to be actively used, to prevent, if possible, adhesions of the iris, closure of the pupil, and consequent destruction of sight.

Q. How is mercurial iritis to be treated?

A. By moderate bleeding, gentle purgatives, and mercury, with opium and belladonna.

Hypopium.

Q. What is hypopium?

A. Hypopium is a collection of viscid coagulating lymph, of a yellow colour, in the anterior chamber of the aqueous humour, and often also in the posterior one, which is discharged from the vessels of the choroides, and other internal membranes of the eye, when these are in a high state of acute inflammation.

Q. What are the symptoms of hypopium?

A. Along with great heat and agonizing pain in the eye-ball, redness and intumescence of the palpebræ, intolerance of light, chemosis, contracted pupil, severe head-ache, fever, and other symptoms of violent ophthalmia, a yellowish fluid is perceived at the bottom of the anterior chamber of the eye, which gradually increases, and at length conceals the pupil and the whole of the iris; if the inflammation be not checked, this fluid accumulates in great quantity, the cornea is distended, becomes prominent, and at last ulcerates; the humours of the eye and the glutinous matter are discharged, a temporary abatement of pain is experienced, and then succeeds prolapsus of the iris.

Q. How is hypopium to be treated?

A. In the first instance, by all those means which tend to subdue the violence of the inflammation; such as copious and repeated venesection, powerful cathartics, nauseating doses of tart. antimon. and low diet; warm anodyne fomentations, mild emollient poultices, and blisters behind the ears.

Q. What treatment is next to be had recourse to?

A. After blood-letting and other antiphlogistics have been employed, and the inordinate vascular action has in some degree abated, the further effusion of lymph must be obviated, and the absorption of what is already effused, accelerated, by the liberal exhibition of calomel, by the application of blisters to the nape of the neck, by exposing the eye to the vapours of spir. ammon. comp. or sulphuric ether, and by frequently washing it with a collyrium of sulph. zinci.

Q. Is it ever proper to discharge the accumulated lymph, by making an opening in the transparent cornea?

A. When great distension of the eye-ball, and other dangerous symptoms are produced, when the cornea threatens to ulcerate, and the structure of the whole eye seems ready to be ruined in consequence of the enormous accumulation of coagulating lymph, the operation ought to be performed.

Exophthalmia.

Q. What is meant by exophthalmia?

A. A displacement or protrusion of the eye-ball from the orbit, by means of external violence or the pressure of tumours, &c. and is generally accompanied with loss of vision.

Q. Enumerate the causes that commonly produce it?

A. Severe concussions of the head, narrow instruments forcibly pushed between the eye-ball and socket, and bony, aneurismal, or other tumours situated in the orbit, frontal sinuses, antrum maxillare or neighbouring parts.

Q. How is exophthalmia to be treated?

A. When it is the effect of violent blows on the head, or of a bayonet, small sword or stick thrust between the orbit and globe of the eye, the dislocated organ should be returned to its natural situation as speedily as possible, and inflammation obviated or reduced by bleeding, purgatives, and other antiphlogistics, both general and local; if suppuration follows, the purulent matter should be allowed to escape as soon as it is formed.

Q. If the eye-ball itself were much injured, would you extirpate it?

A. By no means; it should be replaced in its natural position, unless the muscles and other parts that fix it to the orbit be extensively lacerated and contused.

Q. When the eye-ball is forced from its socket by a tumour or abscess, what method must be adopted?

A. The tumour if possible ought to be removed; if this cannot be effected, the whole eye should be cut away; and when the protrusion is occasioned by an abscess, this must be punctured, and its contents evacuated without delay.

Q. In what way are tumours to be removed from the orbit?

A. In the following; the patient being properly placed, the eye-lid must be held aside, the conjunctiva divided, the tumour laid hold of by a small hook, drawn forwards, and then dissected from its bed.

Abscesses of the Cornea.

Q. What symptoms do abscesses of the cornea present?

A. They are of a yellowish colour, elevated, and attended with redness and inflammation of the conjunctiva, great tension of the eye-ball, intolerance of light, contracted pupil, and increased secretion of tears; they are slow in bursting, and as soon as this happens, the concomitant inflammation is increased, and a small ulcer occupies the place of the abscess.

Q. Where is the pus collected?

A. Either beneath the corneal conjunctiva, or among the layers of the transparent cornea; when it is betwixt the more superficial lamellæ, the abscess appears more prominent, and its fluctuation is more perceptible than when amongst the deeper ones, in which case, it sometimes escapes into the anterior chamber of the aqueous humour.

Q. What are the causes of pustules, or abscesses of the cornea?

A. Inflammation, scrophulous diathesis, &c.

Q. Are they more common in advanced or early life?

A. In early life.

Q. What is the proper treatment of abscesses of the cornea?

A. The general remedies consist in gentle aperients combined with tonic medicines; the local ones, are, in superficial pustules, astringent solutions, vin. opii. and ung. nitric. oxyd. hyd.; in the deeper kind, warm fomentations, emollient poultices, and blisters behind the ears.

Q. Should abscesses on the cornea ever be punctured?

A. It is better to allow them to burst spontaneously, as the matter which they contain is so viscid and tenacious, as to be with great difficulty discharged through punctures, which only tend to aggravate the inflammation.

Ulcers of the Cornea.

Q. What appearances do ulcers of the cornea present?

A. They have an ash-coloured surface, surrounded with high and irregular edges; discharge an acrid serous fluid, and are accompanied with great pain, and symptoms of acute ophthalmy.

Q. What are the effects of these ulcers?

A. If they be very small, they heal without diminishing the transparency of the cornea; but if they spread superficially, they generally leave such an opacity of this coat, as greatly to impede vision; when they penetrate the anterior chamber of the eye, the aqueous humour escapes, and the iris sometimes protrudes, and should the ulceration increase, the crystalline lens and vitreous humour are discharged, and the whole eye completely destroyed.

Q. How are they produced?

A. Either by the bursting of a small abscess, or by extraneous matter placed in contact with, and continually irritating the eye.

Q. In what manner are they to be treated?

A. A piece of nit. argent. should be formed into a point, and applied to the surface of the ulcer, which it immediately converts into an eschar, and in a great measure, deprives of its smarting and extreme morbid irritability; as soon as the eschar is detached, and the pain and heat of the ulcerated part and the ophthalmy return, the caustic is again to be had recourse to, and repeated as often as necessary, care being taken after each application of it, to wash the eye well with some warm mild liquid; in time, the ulcer contracts and shows a disposition to heal. The diligent administration of cathartics greatly accelerates the cure.

Q. When should the employment of the caustic be interdicted?

A. Whenever the surface of the ulcer loses its pale ash-colour and assumes a light red or pinkish appearance, which commonly happens after the third or fourth application.

Q. After the caustic is relinquished, what treatment is necessary?

A. The eye should be frequently bathed with cold astringent lotions, and preserved from the air and light.

Q. If ulceration of the transparent cornea occur during an attack of severe ophthalmy, what mode of practice must be adopted?

A. In this case, the inflammation which is the cause and not the consequence of the ulcerative process, should first be subdued by antiphlogistic measures, and as soon as this is effected, the ulcer must be managed as already recommended.

Q. When the ulceration threatens to perforate the layers of the cornea, what should be done?

A. The cornea ought to be punctured at a distance from the ulcerated point and the aqueous fluid evacuated.

Q. What treatment should be practised in slight excoriations of the cornea?

A. The frequent application of an astringent collyrium.

Opacities of the Cornea.

Q. What are the symptoms of nebula or superficial opacity of the cornea?

A. Nebula is a thin, whitish, turbid spot, covering the whole or a small part of the surface of the cornea, by which vision is more or less impaired; it is preceded by chronic ophthalmy, and accompanied with relaxation of the sclerotic and corneal conjunctiva, and an enlarged and varicose state of the veins of this membrane, both in their trunks and minute ramifications.

Q. What is understood by albugo?

A. It is a dense speck of a clear pearl colour, sometimes situated upon the surface, but for the most part between the lamellæ, or in the very substance of the cornea; seldom attended with inflammation, and never with permanent dilatation and turgescence of the veins of the conjunctiva.

Q. What is meant by leucoma?

A. Leucoma is a thick, white, indurated cicatrix, extending over the whole or greater part of the transparent cornea.

Q. What is the cause of nebula?

A. Long continued chronic ophthalmy, during which, white lymph is extravasated immediately beneath, or into the very texture of the corneal conjunctiva.

Q. How is albugo produced?

A. By an effusion of coagulating lymph between the layers of the cornea, from the excited arteries, during severe acute ophthalmy.

Q. By what is leucoma occasioned?

A. By wounds attended with loss of substance, or by ulcers of the cornea.

Q. How is nebula to be treated?

A. We must first endeavour to make the enlarged vessels contract and resume their natural size, by frequently applying to the eye stimulating and astringent medicines, which, if the disease be recent and not extensive, often prove successful.

Q. When these means are ineffectual, what method of treatment should be resorted to?

A. Dissecting off a part of the fasciculus of the preternaturally enlarged and varicose veins.

Q. Describe the operation?

A. The patient being properly secured, the surgeon with a pair of small forceps raises up the plexus of varicose vessels, which, along with a small portion of the relaxed adjoining conjunctiva, he cuts away, by means of curved scissors, as near as possible to the junction of the cornea and sclerotica; the bleeding from the divided vessels ought to be promoted by the employment of warm fomentations; when it has ceased, the eye should be closed, and for several days bathed with mild emollient collyria; gentle aperients and calomel are to be prudently administered, and if inflammation come on, it must be checked by the proper means.

Q. How is albugo to be removed?

A. When it is just forming, in the first stage of acute ophthalmy, and the structure of the cornea remains uninjured, it generally vanishes under the use of venesection, purgatives, low diet, warm fomentations and poultices; but when it has existed some time, and the inflammation subsided or become chronic, calomel should be given, blisters applied behind the ears, and topical stimulants, as vin. opii. ung. nit. oxyd. hyd. or Janin's ointment, to the eye itself, in order to excite the action of the absorbents, that they may more speedily remove the dense effused lymph.

Q. When this treatment fails, what means should be tried?

A. The albugo should be frequently punctured or scratched with a couching needle.

Q. In what manner is leucoma to be dispersed?

A. In leucoma the natural organization of the cornea is destroyed, and therefore the disease is incurable.

Staphyloma.

Q. What is staphyloma?

A. Staphyloma is an opaque, pearl-coloured protuberance of the whole cornea, of a spherical or pyramidal form, at first soft, but gradually acquiring a firmer consistence, and attended with stillicidium lachrymarum, and perfect abolition of sight. The diseased cornea not only projects beyond the eye-lids, preventing their closure, but becomes thickened, and extending iniad obliterates the anterior chamber of the aqueous fluid, and touches or adheres to the iris. From its constant exposure to the air and contact of foreign bodies, and from the friction of the ciliæ, the eye-ball is always affected with inflammation, which is sympathetically communicated to the other eye; there is often severe head-ache, and in consequence of the pressure of the enlarged cornea and the continual irritation, the cheek and inferior eye lid inflame, and at length ulcerate.

Q. What other appearances does staphyloma exhibit?

A. The surface of the tumour, instead of being even, is occasionally covered with small flesh-like excrescences, sometimes it involves only a part of the cornea, and sometimes it arises from the whole or a great portion of the sclerotica.

Q. What are the causes of this complaint?

A. Repeated ophthalmics, small-pox, wounds, blows, &c.

Q. At what period of small-pox does it commonly appear?

A. About the eleventh day.

Q. By what means is staphyloma to be remedied?

A. Either by caustic or excision.

Q. When is caustic most advantageously employed?

A. In recent cases of staphyloma, and in those affecting only a part of the cornea.

Q. Describe the method of applying it in recent staphyloma?

A. The patient being laid upon his back, and the eye-lids held asunder, a camel's hair pencil dipped in a solution of caustic potass or nit. of silver, or in oxygenated muriate of antimony, is to be applied to the bottom of the tumour; this operation ought to be repeated every day, so that a small artificial ulcer may be formed, which should be kept open until the staphyloma disappears. Any inflammation should be obviated by frequently washing the eye with emollient liquids and saturnine collyria.

Q. How is it to be used in partial staphyloma?

A. The surface of the tumour must be touched with oxygenated muriate of antimony by means of a hair pencil, and then washed with warm water; when the white superficial slough that is thus formed separates and the inflammation appears quite diminished, the caustic should be again applied, and renewed at proper intervals, as long as the disease remains unrelieved.

Q. By what means is the large inveterate staphyloma to be removed?

A. By the following operation; the patient's head being properly supported, and his eye-lids held asunder, the operator introduces a cataract knife at the temporal side of the cornea, a small distance from its junction with the sclerotica, and in a line with the axis of the eye, and carrying it in a horizontal direction completely through the tumour, and cutting downwards separates its lower half by an incision of a semicircular figure. The flap thus formed being then raised by a pair of dissecting forceps, the upper half of the tumour is to be cut away, immediately after which the humours of the eye escape, and the eye-ball sinks within the orbit; the palpebræ are next to be closed and covered with a piece of dry lint, supported by a bandage; the subsequent inflammation is to be reduced by purgatives, warm fomentations and emollient poultices, and the little fleshy papilla left in the middle of the cornea after the cicatrization of the wound, removed by the application of a little nit. argent.

Hydrophthalmia.

Q. What is hydrophthalmia?

A. When the aqueous or vitreous humour, or both of these together are collected in an immoderate quantity, the disease is termed hydrophthalmia, or dropsy of the eye.

Q. What are the symptoms of hydrophthalmia?

A. The capacity of the anterior chamber of the eye is enlarged, and the cornea broader and more prominent; at the commencement of the disease this coat preserves its transparency, but afterwards acquires, as does also the aqueous fluid, a slight turbidness; the eye-ball is hard and distended, its size gradually augments, and in proportion as this takes place, its motions become more and more impeded; at first it is affected with a sense of weight and pressure, afterwards with pain that shoots often with intolerable violence through the head. The sclerotica is of a bluish colour, from the turgescence of its veins; the pupil is partially dilated, the iris becomes of a darker hue, quite motionless, appears situated more iniad, and quivers when the eye is turned or gently struck with the finger. In the beginning of the complaint the patient labours under præsbyopia, the lens grows cloudy, the sight is gradually weakened, paralysis at last affects the retina, and total blindness follows; after the eye-ball has protruded from the orbit, it presses upon the lower eye-lid and cheek, and causes them to ulcerate; the eye itself, owing to its constant exposure and dryness, and the friction of the ciliæ, is attacked with acute ophthalmy that terminates either in complete disorganization or carcinoma of the whole organ, sometimes accompanied with caries of the orbitar bones.

Q. When hydrophthalmia chiefly depends upon a morbid alteration, and increase of the vitreous humour, what symptoms are present?

A. The whole eye-ball, but particularly the inial part, undergoes considerable enlargement and becomes of a conical figure, the anterior chamber seems diminished, the iris is motionless, but retains its original hue, and is pushed towards the cornea, which does not lose its translucency; the movements of the eye-ball are sooner interrupted, the pupil is more contracted, the sclerotica of a darker colour, the pain in the eye and head begins earlier and continues more severe, than when the disease arises from an increase in the quantity of the aqueous humour alone; in the early stage of the complaint the patient is affected with myopia, and vision is very speedily destroyed.

Q. What changes does the structure of the vitreous humour suffer in this disease?

A. The humour itself loses its natural degree of density, and becomes thin and watery, while the tunica hyaloidea is converted into a spongy and fatty substance.

Q. How is hydrophthalmia produced?

A. By blows on the eye or temple, internal ophthalmy, disorder of the constitution, or a morbid state of the coats of the eye; it frequently accompanies other hydropic diseases, and sometimes arises without any evident cause.

Q. How is hydrophthalmia to be treated?

A. In the early stage of the disease, endeavours should be made to improve the general health, and by the administration of calomel, digitalis and other diuretics, to promote the absorption of the accumulated fluid; a seton should be put in the nape of the neck, and the eye frequently bathed with warm fomentations and covered with emollient poultices.

Q. If the disease still advances, what method must be adopted for its relief?

A. The superabundant humours ought to be evacuated either by puncture, seton, or by excision of part of the cornea.

Q. Describe the mode of performing the operation of puncture?

A. The patient being seated on the floor, while an assistant sitting on a chair behind him, secures his head and aids the surgeon in fixing the diseased eye, a small lancet-shaped needle slightly curved near its point, is to be pushed, with its convex side directed iniad, through the sclerotica, very near its junction with the cornea, and in a line with the centre of the pupil, into the posterior chamber; the aqueous fluid is very soon discharged, and as soon as the eye returns into the orbit, the eye-lids should be covered with a pledget of lint, and if inflammation arise, it should be repressed by bleeding, purgatives, warm fomentations, poultices, and proper antiphlogistic measures.

Q. Does the operation of puncture cure the disease?

A. No; it only palliates, never cures the disease, unless it be followed by internal inflammation and suppuration of the eye-ball.

Q. How is the seton to be introduced through the eye?

A. The patient being placed as directed above, a small seton needle, to which only a few threads of silk are affixed, should be inserted at the temporal side of the sclerotic coat, about one-fourth of an inch iniad the edge of the cornea, and thrust directly across the axis of the eye; the threads are next to be tied, but not tightly, and the succeeding inflammation diminished by bleeding and the usual remedies. After the inflammation subsides the silk is to be withdrawn, when the eye is again received into the orbit and covered with the eye-lids.

Q. In what manner is excision of the cornea to be performed?

A. Having properly seated the patient, the surgeon, about two lines from the apex and on the lateral side of the cornea, introduces a cataract knife, and pushing it in a transverse direction towards the mesial canthus, cuts the lower segment of the cornea into a semilunar flap; this being elevated by a pair of small forceps, the remainder of the cornea is to be detached, the humours should then be pressed out, and when the eye-ball has retired within the socket, the eye-lids are to be approximated and covered with simple dressings. The inflammation is to be treated by the usual method.

Prolapsus Iridis.

Q. How do you distinguish prolapsus of the iris?

A. In this painful affection, a part of the iris is seen projecting from the surface of the cornea, in the form of a small brown or grey coloured tumour, towards which, the pupil is drawn, and at the same time changed from its circular into an irregular oval figure. The very sensible and vascular little tumour, by the continual friction of the eye-lids, the acrimony of the tears, and contact of the air, is soon irritated and inflamed; an opaque circle of the cornea forms round its base, and the patient complains of a sharp piercing pain in the eye-ball, accompanied with an annoying sense of constriction; the tears are discharged in great profusion, the eye-lids and the conjunctive tunic are inflamed, and the presence of the faintest light is intolerable; the prolapsed portion at length adheres to the edges of the aperture, through which it has passed, and as the inflammation abates, its extreme sensibility diminishes, and in time becomes almost totally destroyed.

Q. How is prolapsus or staphyloma of the iris produced?

A. In the following manner; when an ulcer or wound of the transparent cornea allows the aqueous fluid to escape, the delicate iris becomes deprived of its support, and being unable to resist the pressure of the lens and other parts situated iniad to it, and the contraction of the muscles of the eye, it is gradually propelled forward, until at last a part of it protrudes at the same orifice, through which the aqueous humour was discharged.

Q. When is prolapsus iridis most likely to occur?

A. When there is a wound attended with loss of substance, or an ulcer penetrating through the cornea; because the edges of the opening cannot in either case be placed in close apposition, and therefore the aqueous humour is continually flowing out, and the iris forced from its proper situation.

Q. How is this affection to be relieved?

A. When the protrusion has recently taken place through a simple incised wound of the cornea, the exposed part of the iris ought, as soon as possible, to be carefully replaced within the eye, by means of a small probe; the eye-lids should then be closed and covered with a compress and bandage, to preserve the lips of the wound in accurate contact; but when the disease is produced by an ulcer, this treatment is of no utility, because as the lips of the aperture cannot be placed in close contact, the aqueous fluid, on the immediate reduction of the tumour, will be discharged and a part of the iris again project beyond the cornea.

Q. When the prolapsus of the iris, then, is in consequence of an ulcer, or has been of long standing and become adherent to the edges of a wound of the cornea, how should it be treated?

A. The little tumour ought, in these cases, to be touched with some escharotic, the best of which is nit. argent. in order to deprive it of its extreme sensibility, and to so far reduce it as to allow the opening in the cornea to heal up.

Q. Describe the method of applying the caustic?

A. The patient being properly seated and his eyelids separated, the surgeon with a piece of nit. argent. scraped to a point, touches the projecting portion of the iris, and then washes the eye with some tepid milk and water, which not only prevents the caustic from acting upon the other parts of the eye-ball, but alleviates the very acute pain occasioned by its application; the surface of the little prominence is soon covered with an eschar, which defends it from the friction of the eyelids, and in a short time, the pain, epiphora, and other symptoms of inflammation gradually subside; as soon as the eschar is thrown off, which happens in the course of two or three days, the constriction of the eye-ball and ophthalmy reappear, though with less severity, when the caustic must be again had recourse to, and repeated until the prolapsed part of the iris is reduced to a level with the cornea, after which, its further employment becomes injurious by destroying the rising granulations, and exciting inflammation in the conjunctiva.

Q. What is the best method of removing those protrusions of the iris, that have grown hard and insensible?

A. Cutting them off with a pair of convex edged scissors, and then applying caustic to the cut surface, to accelerate its cicatrization.

Q. If a recent prolapsus of the iris were cut off, what would be the result?

A. Owing to the tumour having formed no adhesions with the edges of the wound, or ulcer of the cornea, the moment it was rescinded, the aqueous humour would flow out, and in a short time after, another portion of the iris protrude.

Closure of the Pupil.

Q. What are the causes of closure or obliteration of the pupil?

A. This disease is produced by internal ophthalmy; it is also occasioned by protrusion of the iris; or by a gradual contraction and subsequent loss of motion of the fibres of this membrane, which sometimes sooner or later follows operations for the removal of cataract.

Q. Which kind of iritis does this disease most commonly succeed?

A. The syphilitic kind.

Q. How many varieties does closure or obliteration of the pupil present?

A. Two; viz. the simple and complicated; the former is not, the latter is accompanied with some morbid state of the coats or humours of the eye.

Q. How is the disease to be removed?

A. The cure of the simple form is sometimes accomplished by the external application of belladonna or stramonium and camphorated vitriolic collyria. When these means are ineffectual, an artificial pupil should be formed.

Q. When is the operation for artificial pupil most successful?

A. When the dimness of vision depends entirely on closure of the pupil, and when the patient can easily discover the presence of light.

Q. When is it less likely to be attended with benefit?

A. When the disease is complicated with opacity of the cornea, with cataract, or with adhesion of the iris to the capsule of the crystalline lens.

Q. When ought the operation not to be attempted?

A. When the eye is affected with dropsy or staphyloma; when the anterior chamber is obliterated, or the eye-ball turned soft in consequence of a disorganized state of the vitreous humour; when the natural hue and structure of the iris have become altered; or when the retina is diseased and the patient remains insensible to the strongest light.

Q. Is the artificial pupil capable of contraction or dilatation?

A. No; it continues always of the same size, because the iris, after the operation, is perfectly insensible to the stimulus of light.

Q. How many kinds of operation are there for making artificial pupil?

A. Three; viz. corotomia or incision, corectomia or excision,. and corodialysis or separation.

Q. Describe the manner of performing corotomia, or incision?

A. The patient being seated, his upper eye-lid raised, and his eye fixed, the operator introduces a small sharp-pointed knife, with its cutting edge directed backwards, at the outer side of the sclerotica, two lines from the cornea, and pushing it glabellad or forwards, he pierces the iris about a line from its temporal border;

he next carefully conveys the instrument across the anterior chamber until its point almost reaches the mesial margin of the iris, when he withdraws it so as transversely to divide this membrane through its centre. After the operation the eye-lids must be closed, and covered with simple dressings, the patient kept quiet, and inflammation prevented by the ordinary means.

Q. What are the disadvantages of this operation?

A. The cut edges of the iris are apt to reunite, and vision again become abolished or indistinct.

Q. How is corectomia to be performed?

A. The patient being properly placed, and his eyelids held asunder, an opening about a line in length is to be made with a cataract knife, through the cornea close to its margin; a small quantity of the aqueous humour immediately flows out, and a portion of the iris protrudes between the lips of the wound; this protrusion must be seized with a fine hook, and separated by means of a pair of scissors; immediately after the excision the iris retires within the eye, furnished with a pupil, more or less circular.

Q. If no protrusion takes place, owing to slight adhesions of part of the pupillary margin to the cornea, what ought to be done?

A. As soon as the incision in the cornea is completed, a small hook should be introduced into the eye, and when it is fixed to the free part of the edge of the lesser circle of the iris, this membrane must be drawn out and a portion of it removed by a pair of small scissors.

Q. If the pupillary margin adheres to that part of the cornea where the artificial pupil is to be made, what plan should be adopted?

A. The iris ought to be laid hold of, at its larger circle, with a small hook, then dragged out, and a portion of it cut away by means of small scissors.

Q. Describe the operation of corodialysis?

A. After the patient is seated, and his head and eye properly fixed, the surgeon perforates with a fine straight couching needle, the sclerotic coat at its lateral aspect, about two lines from the edge of the cornea; he then passes the instrument along the posterior chamber, as far as the coronal and inial part of the mesial border of the iris, which, to a sufficient extent, he detaches from its very delicate connexion with the ciliary ligament, by pressing the point of the needle, first basilad, and then towards the temple.

Q. What are the disadvantages attending corodialysis, when performed in the manner described above?

A. The needle in passing through the eye may so injure the lens or its capsule as to lay the foundation of cataract, or the point of the instrument may be pushed through the iris too far into the anterior chamber, and wound the cornea; and the operation is inadmissible, if there be any opacity at the mesial border of the cornea, as this would prevent the rays of light from entering the artificial pupil.

Q. Is there any other mode of performing corodialysis?

A. Yes; the needle may be made to puncture the cornea, and the iris separated from the ciliary ligament, opposite a transparent part of the former membrane, instead of being entered at the sclerotica, and the iris detached at its nasal edge.

Q. To what cases of closed pupil do you deem corodialysis the best adapted?

A. To those in which only a very minute part of the cornea is transparent; to those in which the posterior chamber is nearly filled with coagulating lymph; and to those complicated with adhesions of the uvea to a capsulo-lenticular cataract.

Q. By what symptoms do you ascertain that lymph is extensively effused into the posterior chamber, or that a cataract exists?

A. The first is known by the peculiar alteration of colour which the greater ring of the iris undergoes; the second, by the patient's almost total want of vision.

Q. What cases would you select for corectomia?

A. Those complicated with opacity of a considerable portion of the cornea, or where this tunic and the iris adhere together, while the lens possesses its natural transparency; also those following extraction of the cataract, and are not accompanied with extensive extravasation of coagulating lymph into the posterior chamber of the aqueous humour, or with opacity of the remaining capsule of the lens.

Q. In what cases of closure of the pupil is corotomia chiefly indicated?

A. In those where the affection has gradually come on after extracting a cataract; and where the whole of the surface of the cornea is transparent.

Q. In what manner should cataract, when it attends closure of the pupil, be removed?

A. It ought either to be depressed before making the artificial pupil, or to be freely divided after this is made, and the pieces pushed through the newly formed aperture in the iris into the anterior chamber, to be dissolved by the aqueous humour and absorbed.

Q. Would you form an artificial pupil, if vision were perfect in one eye?

A. By no means; because in consequence of the sympathy that exists between the visual organs, the sound eye would become inflamed, and its power considerably diminished by the operation performed on the diseased eye.

Q. Does any other cause require the formation of an artificial pupil, besides closure or obliteration of the natural one?

A. It is sometimes necessary to make one, when sight is impeded by an opacity of the cornea, being situated directly opposite and concealing the natural pupil.

Cataract.

Q. What is cataract?

A. A diminution or complete loss of vision produced by an opaque state of the crystalline lens, its capsule, or of both.

Q. What are the causes of cataract?

A. The most frequent are a long continuance of intense light, looking at minute objects, blows or wounds of the eye, or inflammation of the lens and its capsule; the disease is sometimes congenital, sometimes the consequence of an hereditary taint, and not unfrequently appears to arise spontaneously.

Q. At what period of life does it commonly occur?

A. It is more frequently met with in old age than in youth.

Q. What are the symptoms of cataract?

A. At the commencement of the disease a mist or cloud appears before the eyes, which seems to envelope every object around, and gradually becomes more dense; a black circle appears at the edge of the pupil, and behind its centre is observed an opaque spot which grows more and more perceptible, and at length becomes so large as to render vision very indistinct; the iris retains its power of motion, and the patient is able to perceive objects better in a weak than a strong light, and when they are placed on one side than directly in front of the eye. The formation of cataract is sometimes speedy, generally slow, and not attended with any pain.

Q. What is the cause of the black circle which is seen at the edge of the pupil?

A. It arises partly from the dark margin of the pupil, which is naturally invisible, being rendered very conspicuous by the contrast of the white surface of the cataract, and partly by the shadow of the iris falling on the opaque anterior layer of the crystalline capsule.

Q. How are cataracts divided?

A. Into genuine and spurious.

Q. How many different kinds of genuine cataract are there?

A. Three, viz. the lenticular, capsular, and capsulo-lenticular; the last has several varieties.

Q. How many kinds of spurious cataract are there?

A. Four, the lymph, the purulent, the bloody and the dendritic.

Q. Are not cataracts of different degrees of consistence?

A. Yes; some are firm or hard, some milky or fluid;

while others are soft or caseous; some cataracts are even of a bony structure.

Q. Do not cataracts vary in colour as well as in consistence?

A. They are generally of a bluish-white colour: but some are yellow, white, green, or black.

Q. What are the characteristic symptoms of the lenticular cataract?

A. It commences in the very centre of the lens, is tardy in its progress, generally small and firm, and appears situated at a great distance iniad the pupil; its middle part is of a dark greyish colour, which gradually acquires a lighter shade towards the circumference; the motions of the iris are not obstructed, and sight is impaired.

Q. How do you distinguish the capsular cataract?

A. By its beginning in the form of very white shining streaks at the edge of the pupil, being dappled, greatly affecting the motions of the iris, and ultimately producing disease in the lens itself; it is subdivided into anterior, posterior, and complete capsular cataract, as the glabellar or inial part, or the whole capsule of the lens is opaque.

Q. What appearances does the capsulo-lenticular cataract present?

A. It is of a pearl-colour, mixed with very white layers, is of an extremely large size, obliterates the posterior chamber of the eye, and greatly diminishes the anterior one; it forces the iris towards the cornea, renders it motionless, and destroys vision.

Q. What are the symptoms of the lymph cataract?

A. This variety of the disease is the effect of inflammation, and preceded by pain in the head and eye, the pupil is angular and contracted, and the iris immoveable; a flake of very white coagulating lymph is perceived iniad the pupil, and sight is either greatly impaired or quite abolished.

Q. What are the diagnostic characters of the purulent cataract?

A. A yellowish-coloured matter, to which the angular and contracted pupil adheres, is observed lying in the posterior chamber, the iris advances towards the cornea, and is deprived of its power of contraction and dilatation, while vision is nearly or altogether destroyed.

Q. What are the symptoms of the blood-cataract?

A. When it is produced by unabsorbed effusions of blood, in consequence of blows on the eye, it presents behind the pupil, which is angular, but not very small, a dusky red flake mixed with lines of white lymph; the iris is immoveable, and the sight very imperfect; when it is occasioned by extravasations of blood, the result of acute ophthalmy, it appears in the form of a white thick layer occupying the posterior chamber, is covered with minute reddish spots, and often protuberates into the anterior chamber through the very contracted and angular pupil; the motions of the iris are lost, and eyesight destroyed.

Q. What is a dendritic cataract?

A. It always succeeds violent blows on the eye-ball, and is accompanied with nearly total loss of vision; the lens and its capsule are displaced by the concussion, and soon grow turbid, and an arborescent appearance is observed upon the anterior surface of the latter, which is produced by a portion of the tapetum of the uvea resting there, after having been detached from its proper situation.

Q. What are the symptoms of a hard cataract?

A. A hard cataract is of a dark colour, and its anterior surface appears flat, its size is small, which renders the space betwixt it and the pupillary margin large and distinct; the motions of the iris are not impeded, and along the edge of its lesser circle a black ring is very conspicuous, the patient readily discerns any luminous body, and when the pupil is dilated by belladonna, possesses a considerable degree of vision.

Q. What are the appearances of the milk or fluid cataract?

A. It is of a very light colour, appears most opaque at its basilar part, and its surface is dappled with spots or streaks that alter their situation, and alternately disappear and come into view by suddenly moving or pressing the globe of the eye. From the large size and convexity of this cataract, it touches the border of the pupil, and consequently there is no dark circle surrounding the opacity; the iris is pressed forward towards the cornea, its motions are greatly interrupted, and sight nearly altogether destroyed.

Q. What are the symptoms of a soft or caseous cataract?

A. It is of a dirty white or greenish hue, and has a spotted or cloudy appearance, is much larger than the fluid cataract, renders the iris almost quite motionless, and the patient quite incapable of detecting the presence of light.

Q. What is meant by a secondary membranous cataract?

A. A secondary membranous cataract is an opacity occurring in the remaining capsule of the lens, after the latter has been extracted.

Q. What are the characters of congenital cataract?

A. Congenital cataract is of two kinds, the most common is capsular, and presents a white opacity behind the pupil, formed by the anterior and posterior layers of the crystalline capsule approximating, and then uniting after absorption has removed the lens, which always happens as soon as this body has become opaque; in the other kind, only the centre of the lens is opaque, its circumference continuing transparent; if it be punctured, however, its whole substance instantly becomes turbid, and then begins to diminish.

Q. With what diseases of the eye may cataract be complicated?

A. It is often attended with ophthalmy, hydrophthalmy, pterygium, opacities of the cornea, closure of the pupil, synechiæ anterior and posterior, glaucoma, synchysis or amaurosis.

Q. What is glaucoma?

A. It is a disease of the vitreous humour, in which this substance becomes opaque and of a green colour;

when it affects the lens it constitutes the cataracta viridis, which exhibits a greenish tinge, is very large, and attended with severe pain in the head; the margin of the pupil is turned iniad, and drawn out in angles towards the canthi; the diseased lens owing to its magnitude, protrudes through the pupil, and completely hides the lesser circle of the iris; this membrane loses its natural hue and becomes perfectly motionless, the vessels of the eye-ball are enlarged and varicose, the patient is totally blind, but frequently perceives flashes of fire within the eye.

Q. How do you ascertain when cataract is complicated with synchysis?

A. It is known by the eye feeling soft, the iris hanging loosely in the aqueous fluid, and having a waving motion, and the cataract tremulating when the eye is suddenly turned or agitated.

Q. What symptoms would induce you to conclude that cataract was accompanied with amaurosis?

A. The patient being perfectly blind, the iris immoveable, and sometimes projecting towards the cornea, and the pupil being exceedingly dilated.

Q. Which kind of cataracts is of most common occurrence?

A. The caseous or soft kind.

Q. What means are had recourse to for the cure of cataract?

A. Internal and external medicines, and a variety of operations.

Q. What are the internal medicines?

A. Emetics, cathartics, and sternutatories.

Q. What are the external?

A. Bleeding, issues, blisters, powerful embrocations, and the application of stimulating vapours to the eye.

Q. Enumerate the different kinds of operations employed for the removal of cataract?

A. Couching, reclination, extraction, ceratonyxis, and dislocation.

Q. Are medicines much to be confided in, in the treatment of cataract?

A. No; they are seldom successful in dispersing the disease.

Q. In what cases are they generally found most beneficial?

A. In those produced by external violence, although cataracts arising from other causes, sometimes disappear under their use.

Q. When is an operation likely to be attended with success?

A. When the cataract has arisen spontaneously, and is uncomplicated with any morbid affection of the eye or disorder of the general system; when the patient possesses a ready perception of light; when the pupil is not angular, and when the iris retains its natural power of motion.

Q. When is the result of an operation likely to prove unsuccessful?

A. When the cataract has been occasioned by external injury, or is accompanied with some other disease of the eye or its appendages, or with some constitutional derangement.

Q. Would you perform any operation, if only one eye were affected?

A. Some eminent oculists recommend it to be deferred so long as the patient can see distinctly with one eye, while others object to this opinion, and consider the delay of the operation very injudicious, and sometimes productive of serious consequences.

Q. Is it safe and proper to perform the operation for cataract upon very young children?

A. Perfectly so; and ought always to be had recourse to as soon as the patient has attained his third year.

Q. Enumerate the advantages of an early operation?

A. When the child is very young, he is more manageable, the cataract is generally fluid, and the eye is more steady, and has none of that peculiar rolling motion, which it acquires in the course of two or three years.

Q. Describe the operation of couching?

A. The patient being placed upon the floor or a low stool, and in such a situation that the rays of light may impinge obliquely upon his face, the eye not to be operated on is to be closed, while the head is reclined backwards and supported by an assistant, who sits behind on a chair and helps to fix the eye. The surgeon now seats himself directly in front of, and considerably higher than the patient, and with the fore and middle fingers of his left hand depresses the inferior eye-lid; he then directs the diseased eye to be turned towards the nose, and taking the couching needle, which he holds like a writing pen, and resting his elbow upon his knee raised to a convenient height, in order to render his hand more steady, quickly introduces the instrument through the sclerotica, about two lines from the edge of the transparent cornea, and a line basilad the transverse diameter of the eye; as soon as the needle has passed through the coats of the eye and vitreous humour, it should be directed towards the coronal surface of the cataract, and then moved in such a manner as to depress this somewhat basilad; its point should next be cautiously conveyed in a transverse direction, between the ciliary processes and the opaque lens, along the glabellar aspect of the latter, and as far as its nasal margin, care being taken not to injure the iris. The extremity of the instrument now visible through the pupil, should be directed by drawing its handle forwards away from the temple iniad and basilad, in order to sink the lens and its capsule deep in the vitreous humour; the operator recollecting to freely lacerate the latter, previous to depression. After the operation, the eye-lids should be closed and covered with a piece of fine linen, the patient confined to a dark room, and rest, low diet and antiphlogistics prescribed; in three or four days the eye may be opened and protected by a green silk shade, which in three weeks or a month may be laid aside.

Q. Is it not proper, before commencing the operation, artificially to dilate the pupil?

A. This ought never to be neglected, and should be done once or twice in the course of twenty-four hours, by thickly covering the upper eye-lid with a solution of the extract of belladonna.

Q. Why should the needle be introduced so far as two lines from the border of the cornea?

A. That it may not injure the corpus ciliare, as wounds of this very nervous and vascular part are often succeeded by great constitutional disorder, severe pain in the eye, iritis, closure of the pupil, and immobility of the iris.

Q. On what account is the needle entered below the transverse diameter of the eye?

A. In order that it may not wound the long ciliary artery, which runs between the sclerotic and chŏroid coats in a line opposite the axis of the pupil; if this vessel be punctured, it discharges its blood into the chambers of the aqueous humour, conceals the iris and point of the needle, and renders the operation more embarrassing.

Q. Should the needle be withdrawn immediately after the depression of the cataract?

A. No; it should be allowed to remain in the eye until the surgeon has ascertained that the opaque lens is permanently fixed in the vitreous humour, and then carefully brought out.

Q. Should the capsule of the lens be lacerated and depressed, if free from all opacity?

A. The whole of the crystalline capsule, but especially its glabellar layer, however perfect its transparency may be, ought invariably to be freely lacerated and depressed, because if this be omitted, it may become opaque, and form what is termed a secondary membranous cataract.

Q. How should adhesions of the capsule to the iris be destroyed?

A. By cautiously dividing them with the edge of the needle.

Q. If the cataract be of the fluid kind, how do you proceed?

A. In this case, after the needle is introduced, it is only necessary to lacerate well with its point the anterior layer of the crystalline capsule; when this is effected, the fluid and milk-like lens is discharged into the anterior chamber, mixes with the aqueous fluid, and renders it so turbid as to prevent the iris and pupil from being discerned. In a short time, however, the extravasated cloudy matter is absorbed, the aqueous humour acquires its natural clearness, the pupil presents no opacity, and vision is restored.

Q. If the cataract be a caseous one, what must be done?

A. As it is impracticable to depress this form of cataract, the front layer of the crystalline capsule should be freely lacerated, and then the substance of the diseased lens discomposed and cut in pieces, each of which should be pushed into the anterior chamber, where they are very speedily absorbed.

Q. How should you proceed in a case of membranous cataract?

A. Whether it consists of the whole of the capsule of the lens, as happens in primary membranous cataract, or of the anterior or posterior part, as occurs in secondary membranous cataract, in either case, it should be very freely divided or broken into minute portions, all of which are to be carefully conveyed before the point of the needle into the anterior chamber, whence they are soon removed by absorption.

Q. What bad consequences are sometimes produced by pushing large pieces of cataracts through the pupil?

A. Angularity of the pupil, or laceration of the iris.

Q. In what kind of cataracts is couching or depression to be had recourse to?

A. In those which are firm but small; in the primary and secondary membranous; or in the secondary lenticular cataract.

Q. How is reclination to be performed?

A. The preliminary steps of the operation are the same as those in couching, the opaque lens, however, in reclination is dislodged in such a manner, that its coronal edge is placed iniad, its basilar one glabellad, its glabellar surface coronad, and its inial surface basilad, and instead of being carried iniad and basilad, it is pushed directly iniad and lodged in the very centre of the vitreous humour.

Q. Can reclination be done in any other way ?

A. Yes ; the needle may be entered at the cornea, and carried through the pupil to the opaque lens, which is to be turned back as directed above. In this mode of performing reclination, however, the surgeon has greater difficulty in displacing and managing the cataract, and is more liable to wound the iris, than in the other above described, where the needle is introduced through the sclerotica.

Q. When is reclination to be preferred to couching ?

A. In cases of very hard and of several species of capsulo-lenticular cataract, and also in those examples of cataract, where the opaque lens has become adherent to the iris.

Q. Describe the operation of extraction ?

A. The patient being placed on a low chair with a high and perpendicular back, and his sound eye covered with a compress, the surgeon and assistant are to be seated in the same manner as in the operation of couching, and with their fore and middle fingers to keep the eyelids asunder, and to fix the eyeball ; the surgeon then desires the patient to turn the eye to be operated on somewhat laterad, and taking the cataract knife, which he holds like a couching needle, introduces it at the temporal side of the cornea, one eighth of a line from its connexion with the sclerotica, and one-fourth of a line above its transverse diameter ; he now pushes it in a horizontal direction, with its blade parallel to the iris, quite across the anterior chamber, until its point passes through the mesial side of the cornea, exactly opposite the part where it was first entered. As soon as one-third of the blade has emerged, all pressure must be removed from the eye, and the knife, with its handle slightly lowered, directed on towards the nose, in order that it may cut itself out and detach a little more than half of the cornea from the sclerotica ; after the section of the cornea is completed, the superior eyelid should be allowed to fall over the eye, in order that the light may be prevented from entering it, and the pupil of course become expanded. In a minute or two the lid should again be elevated, and a capsule needle introduced beneath the flap of the cornea, then carefully conveyed through the pupil, and made by moving its point in various directions, to lacerate the anterior layer of the crystalline capsule ; the eye must now be gently compressed, when the opaque lens is forced through the pupil, and soon escapes at the wound in the cornea. After the cataract is removed, the lips of the incision are to be placed in close apposition, the eyelids brought together, covered with a piece of fine linen besmeared with mild ointment, and then secured by compress and bandage. The patient must be laid horizontally, confined to a darkened room and allowed only the sparest diet ; on the seventh or eighth day the eye may be opened and defended merely by a green silk screen.

Q. What is meant by punctuation and section ?

A. Punctuation is employed to express the former ; section, the latter part of the incision made in the transparent cornea.

Q. How should the incision in the cornea be made, when this is very flat, and the iris projects considerably into the anterior chamber ?

A. Under these circumstances, the surgeon should separate with the knife, instead of more than half, only about one-third of the cornea from the sclerotica, and afterwards enlarge the opening at its temporal angle, by means of a pair of blunt-pointed curved scissors, the blades of which, during their application, should not be too widely extended, lest the iris be injured.

Q. How should the incision in the cornea be made, if this tunic be very convex and the fissure between the eyelids unusually narrow ?

A. In this case, the knife after it has been entered at the usual place, viz. the temporal side of the cornea, must not be pushed directly across the centre of the pupil towards the nasal angle of the eye, but in a slanting direction mesiad and basilad, so that the incision may not be made horizontally, but obliquely outwards, and the flap not formed entirely of the lower segment of the cornea, but of its basilar and lateral part.

Q. When the anterior layer of the crystalline capsule is opaque, how is it be removed ?

A. It should be cut out in a circular form, as near to the margin of the pupil as possible, by the repeated punctures of a capsule needle, bent near its extremity; if it cannot be brought away on the point of the instrument, it should be extracted by a pair of small forceps.

Q. How is the opaque posterior layer of the crystalline capsule to be taken away ?

A. By the following method; a cataract tenaculum, with its point held downwards, should be carefully introduced into the eye; the opaque posterior layer, and the membrana hyaloidea immediately connected to it, are to be freely divided, and then extracted with the point of this instrument, which should be directed upwards in being withdrawn.

Q. If you fail to expel a cataract by moderate pressure, what plan would you adopt ?

A. Gently compress the lower part of the eye-ball with the left fore and middle fingers, and then introduce between the pupillary margin and inferior border of the opaque lens a small scoop, by means of which the cataract will be easily brought away; if the contraction of the pupil impede the expulsion of the opaque lens, it must be made to dilate by darkening the eye.

Q. How should small fragments, which are sometimes broken from the surface of a soft cataract, in passing through the pupil, be removed ?

A. By means of a small scoop, care being taken previous to its introduction, to gently rub the surface of the eye with the finger, which has the effect of bringing the small pieces more into view.

Q. In what way are very fluid cataracts to be *extracted.*

A. The capsule of a fluid cataract must on no account be punctured, and the fluid lens allowed to escape, as is done in couching, but as soon as the incision in the cornea is completed, a cataract tenaculum or forceps should be introduced into the anterior chamber, directed through the pupil, and then made to lay hold of the capsule, which should be drawn out along with its contained dissolved lens.

Q. Enumerate the accidents with which the operation of extraction is liable to be attended?

A. Smallness of the opening in the cornea, prolapsus, wounds, and inflammation of the iris, escape of the vitreous humour, and ceratocele.

Q. What is the cause of too small an opening being made in the cornea?

A. It is occasioned principally by the operator, in cutting this tunic, not keeping the blade of the knife parallel with the iris, but turning its edge too much forward.

Q. What are its consequences?

A. When the incision is too small, such great pressure is used to accomplish the expulsion of the cataract, that a part of the vitreous humour is forced out, and the lesser circle of the iris at the same time so violently contused between the cornea and opaque lens, that either ophthalmia iridis, or closure of the pupil is produced.

Q. How is the corneal opening to be enlarged?

A. Whenever it is observed to be too small, it ought to be enlarged at either angle, by a pair of blunt-pointed curved scissors carefully employed, before any other part of the operation is gone on with.

Q. How does the iris become wounded?

A. In two ways; first, if the edge of the knife be inclined too far iniad while the operator is making the section of the cornea, the ciliary margin of the iris will be wounded; second, if the aqueous humour be evacuated before punctuation be completed, the basilar part of the iris will glide under the edge of the knife, and if not replaced, which may be effected by gently rubbing the surface of the eye with the point of the finger, its fibres will be more or less divided.

Q. What circumstances occasion the escape of the vitreous humour?

A. The loss of the vitreous humour is caused by great pressure applied to the eye, either during the section of the cornea, or the extraction of the cataract; by the membrana hyaloidea being punctured with the capsule needle at the time of using it, to lacerate the crystalline capsule; or by the same delicate membrane being injured with the scoop, when employed to remove the fragments of a cataract.

Q. If the hyaloid membrane be wounded, and the vitreous humour escape during each attempt to press forward the cataract, what plan should be had recourse to?

A. Whenever the membrana hyaloides is divided, the opaque lens, as soon as any pressure is made to expel it, retreats towards the bottom of the eye, and the vitreous humour, gliding past its edges, is discharged: in this state of things, the surgeon should gently press with his left fore finger on the antinial part of the eye-ball, and then introduce through the opening in the cornea, a small hook, with the point of which he must lay hold of the cataract and extract it.

Q. What is meant by ceratocele?

A. It is a sort of hernia of the cornea, and presents in the form of a whitish, pellucid, oval vesicle, protruding between the lips of the incision made in this tunic, the lamellæ of which are only partially healed. It is cured by being cut off, and afterwards keeping the eye well closed for ten days.

Q. When is the operation of extraction impracticable?

A. In cases where the iris projects considerably into the anterior chamber, and almost touches the cornea, where the former extensively adheres to the latter tunic; where the pupil cannot be artificially dilated in consequence of its permanent contraction, where the opaque crystalline capsule has contracted adhesions with the uvea, where the cleft between the eye-lids is extremely narrow, or, where the eye-ball is deeply sunk within the orbit.

Q. How is ceratonyxis, or division to be performed?

A. The patient, surgeon, and assistant, being seated as in extraction, a straight spear-shaped couching needle is to be entered at the basilar part of the cornea, a line and a half from its junction with the sclerotica, and then conveyed through the pupil, previously dilated with belladonna, as far as the crystalline capsule, which together with its contained lens, must be freely divided and almost totally destroyed by moving the point of the instrument in every possible direction; if the pupil contract during the operation, it must be made to expand by covering the eye for a short time with a dark shade.

Q. What is the object of this operation?

A. To effect a complete division of the opaque lens and its capsule, so that it may be more speedily acted upon by the aqueous humour, become dissolved and then removed by absorption.

Q. To what kind of cataracts is ceratonyxis most applicable?

A. To the congenital, soft or fluid kind; it is inadmissible in very hard, capsulo-lenticular, or spurious cataracts.

Q. What are the objections to ceratonyxis?

A. One consists in the very great danger there is of wounding the pupillary margin, in consequence of the iris often very suddenly contracting as soon as the needle has arrived at the cataract; and the other, in the liability that remains to the formation of secondary membranous cataract, after the operation.

Q. How should dislocation be performed?

A. The surgeon, patient, and assistant, being placed as in the operation of extraction, and the pupil dilated by the application of belladonna, Hey's couching needle should be introduced through the sclerotica, two lines iniad the cornea, and the crystalline capsule lacerated with its point; after this, the instrument ought to be taken away, and the lens pressed through the pupil into the anterior chamber, whence it may be extracted by making an opening in the cornea; or a couching needle, the thickness of which diminishes towards the handle, is to be pushed through the same part of the cornea as is punctured in ceratonyxis, then carried through the pupil, and its point made to freely lacerate the crystalline capsule; as soon as all the aqueous fluid is evacuated, the needle should be withdrawn, and the lens by gently compressing the eye-ball, forced through the dilated pupil into the anterior chamber, whence it will be removed by absorption.

Amaurosis.

Q. What is amaurosis?

A. A dimness or complete loss of vision produced by a paralytic affection of the retina or optic nerve.

Q. Describe the symptoms and progress of amaurosis?

A. In amaurosis, the pupil is very much dilated, more or less angular, and of its natural dark colour; the iris remains immoveable in the strongest light, and the power of vision is very limited, or altogether abolished; the disease sometimes appears suddenly, but for the most part steals on by degrees, seldom affects both eyes at once, and its attack is often accompanied with pain in the head, which however gradually abates; the patient perceives flashes of light dart across his eye, fancies that cobwebs, insects, or variously shaped small black bodies are flying before him, and often complains of a sensation as if sand were under the eye-lids; he is generally affected with a degree of strabismus, and not unfrequently loses all controul over the muscles of the eye-ball, so that this acquires an incessant rolling motion, and cannot be accurately directed towards any object; the eye looks inanimate, horn-like and glassy, often feels distended and dry, and in some cases presents a pale, grey, or greenish appearance at its bottom.

Q. Are not the symptoms of amaurosis very irregular?

A. Extremely so; the pupil, in many cases, instead of continuing in a state of dilatation, contracts during exposure to intense light, and the motions of the iris are remarkably free; the patient is sometimes long-sighted, sometimes short-sighted, and often sees all the objects around him double, distorted, or of a different colour from what they really possess, or imagines that they are covered with a dark mist, or thick net-work; in some instances, the retina is so preternaturally sensible, that a brilliant light becomes painful, in others its sensibility is diminished, and a vivid light is the most agreeable.

Q. What are the small bodies appearing before the eyes, termed?

A. Scotomata or muscæ volitantes.

Q. What is the cause of the white or greenish appearance at the bottom of the eye?

A. The diseased retina, which has become so thickened and opaque as to reflect the rays of light that fall upon it.

Q. Explain the reason why objects situated on one side, are more distinctly discerned than those in front of the eye?

A. It is because the retina is not so much affected with opacity in any part, as its centre.

Q. How is amaurosis to be distinguished from cataract?

A. The diagnostic characters of amaurosis are, there often being no opacity; the opacity when present being situated far behind the pupil, appearing concave, of a white or greenish hue, and frequently having red streaks upon it, and never bearing an accurate proportion to the degree of loss of sight; the pupil being dilated and angular, and the eye looking dull and glassy.

Q. What are the causes of amaurosis?

A. Amaurosis is occasionally congenital, and even hereditary; it is however more frequently produced by derangements of the chylopoïetic viscera, suppressed secretions, hysteria, hemorrhage, narcotic substances, ophthalmia, concussions of the head or eye-ball, injuries of the supra-orbitary nerve, pressure on the optic nerve in consequence of undue determinations of blood to the head, tumours within the cranium, &c. by a turgid state of the vessels of the choroid coat, immoderate excitement of the eye or whole system, or by disorganization of the retina or optic nerve.

Q. What individuals are most subject to this disease?

A. Those who have black eyes; but it is not more frequently met with at one period of life than another.

Q. Into how many varieties is amaurosis divided?

A. Into six; viz. the complete or incomplete; inveterate or recent; continued or periodical.

Q. When is the prognosis of amaurosis to be considered favourable?

A. When the disease is not produced by any cause likely to disturb the organization of the retina or optic nerve, when it does not entirely bereave the patient of sight, when it occurs in young people, has appeared suddenly, been of short duration, or is periodical; when it is occasioned by violent emotions of the mind, disordered stomach, the throes of parturition, or convulsions; when it is attended with no pain, and the pupil remains circular and of its natural dark colour.

Q. When is it to be considered unfavourable?

A. When the complaint takes place in old people, when it has been of long continuance, becomes complete or its progress been tardy; when it is accompanied with severe pain in the head, or globe of the eye, or, with epilepsy or convulsions; when it has been produced by violent ophthalmia, concussions of the head or eyeball, or when it depends upon a change in the organic texture of the eye. The prognosis, in short, is generally unfavourable, except when amaurosis is symptomatic of some other disease.

Q. How is amaurosis to be treated?

A. When it originates in derangement of the gastric system, the stomach and bowels should be freely and regularly unloaded by emetics and purgatives; after this, the vigour of the whole system should be increased by the exhibition of tonics, by nourishing diet and country air, and lastly, the torpid condition of the retina should be removed by ammoniacal vapours directed to the eye, by blisters and stimulating embrocations applied to the temples, by electricity and sternutatories; when it is produced by a plethoric state of the blood-vessels of the head or eye, or by external injuries of these parts, blood-letting both general and topical, purgatives and other evacuants, cold applications to the head, and blisters to the nape of the neck should be had recourse to.

Q. How is amaurosis arising from debility of the constitution, or of the eye itself induced by previous undue excitement, to be cured?

A. By gentle aperients, tonics, &c. and by stimulating applications to the eye.

Q. How is amaurosis suddenly produced by violent fits of anger, immoderate exercise, &c. to be treated?

A. In this case, general and local bleeding are to be employed, after which, an emetic should be administered, the bowels well emptied, and the head and eye washed with cold lotions.

Q. How is amaurosis, occasioned by suppressed secretions, to be removed?

A. First, by restoring the accustomed discharge, and then administering an emetic and purgatives.

Q. How is periodical amaurosis to be cured?

A. By emetics and Peruvian bark.

Hemeralopia.

Q. What are the symptoms of hemeralopia?

A. In this disease, which depends upon a preternatural sensibility of the retina, the patient, during the day, or in a bright light, is not able to discern any thing distinctly; but at night, or in a dark shade, his vision becomes more clear; the pupil is sometimes contracted, sometimes dilated, and there is an incessant nictitation.

Q. What are the causes of this complaint?

A. A continued glare, sudden exposure to light after confinement in almost perfect darkness, ophthalmia, and deficiency of the pigmentum nigrum covering the tunica choroides.

Q. When is the prognosis of hemeralopia to be accounted favourable?

A. When it proceeds from any of the three first causes; but unfavourable, when it is occasioned by the last.

Q. What individuals are most liable to it?

A. The inhabitants of hot climates, miners, and old people.

Q. What is the proper treatment of hemeralopia?

A. The eyes should be covered with a green shade, and belladonna, hyosciamus and other sedatives employed both internally and externally. If there be any inflammatory excitement, the antiphlogistic must precede the sedative plan.

Nyctalopia.

Q. What are the symptoms of this disease?

A. In nyctalopia, the vision at night is very feeble and dim; but during the day, or in a strong light, perfectly distinct.

Q. By what cause is this disease produced?

A. By long exposure to a dazzling light. Nyctalopia is sometimes periodical, and not unfrequently endemic.

Q. How should it be treated?

A. By the application of blisters to the temples, and ammonical or other stimulating vapours, and vin. opii. to the eye; in the intermittent form, these means should be conjoined with bark.

Cancer of the Eye.

Q. Describe the symptoms and progress of cancer of the eye?

A. In the beginning of the most common form of the disease, the eye is affected with burning heat and inflammation, and in a short time after becomes swollen, then grows hard and knobby, and of a purple colour, from enlargement and a varicose state of the vessels of the albuginea; all power of vision is destroyed, the enormous eye-ball soon protrudes from the socket, has a flesh-like appearance, is extremely painful, occasions the most excruciating head-ache, and by its pressure renders the bones of the orbit carious; if it should ulcerate, which it not unfrequently does, the ulcerated surface becomes exquisitely sensible, discharges an offensive sanies, and sometimes alarming quantities of blood; the glands about the angle of the jaw, and along the neck, enlarge and inflame; the constitution at length sinks under the excessive and continual irritation, and the patient is destroyed.

Q. Does cancer of the eye begin in any other way?

A. It sometimes commences in a malignant ulcer, situated on the surface of the eye-ball, or upon one of the eye-lids; and sometimes in a small excrescence growing from the transparent cornea, which although apparently harmless at first, yet after being cut off, returns and ultimately becomes cancerous.

Q. At what age does cancer of the eye commonly appear?

A. It generally occurs in those who are in the decline of life.

Q. What are its causes?

A. Violent contusions of the eye-ball, constitutional disease, and sometimes it comes on without any obvious cause.

Q. How is it to be treated?

A. The only remedy is extirpation of the eye.

Q. Is the operation generally successful?

A. It is, when employed in the very commencement of the disease, and when this is entirely confined to the globe of the eye; but it only tends to accelerate the patient's dissolution when had recourse to in the latter stages of the complaint, when the brain and surrounding parts have become tainted, and the bones of the orbit carious; the cancerous affection, however, sometimes reappears in the orbit after every morbid part has apparently been removed.

Fungus Hæmatodes of the Eye.

Q. What are the symptoms of fungus hæmatodes of the eye?

A. Fungus hæmatodes commences with dimness of vision, and slight inflammation of the conjunctiva, the iris becomes motionless, and the pupil unalterable in every degree of light; a white, amber, or green coloured substance is observed at the very bottom of the eye, which gradually increases in size, and advances towards the cornea; in its progress it obliterates both the chambers, and fills up the pupil; the eye-ball now loses its natural spherical figure, becomes knobby, of a livid colour, excessively painful, and protuberates from the orbit; the head-ache is intolerable, and sight completely abolished; in a short time the transparent cornea ulcerates, and through the ulcerated aperture, a dark purple fungous tumour projects, which discharges a thin fœtid matter, often bleeds profusely, frequently mortifies, and drops off, but again speedily springs up; sometimes this fungus bursts through the sclerotica, and then pushes the eye-ball from the socket; in the last stage of fungus hæmatodes of the eye, the lymphatic glands of the neck become contaminated, inflame, and ulcerate; great constitutional irritation is excited, and this sooner or later destroys the patient.

Q. What is the cause of this disease?

A. External violence, or constitutional disorder. It seldom affects both eyes at once.

Q. Which parts of the eye are first affected in this disease?

A. The retina and optic nerve.

Q. What is the green or yellow appearance observed at the bottom of the eye?

A. It is the surface of the retina, which, in fungus hæmatodes of the eye, loses its original hue, becomes opaque, and swells into a tumour of a soft medullary structure.

Q. What appearances do the brain and its membranes present on dissection?

A. Purple coloured spots are sometimes observed on the dura mater, or, a number of white tumours, containing a thick fluid, on the membrana arachnoides and pia mater; and one or both of the thalami nervorum opticorum are found disorganized and changed into a bloody pulpy mass.

Q. How is fungus hæmatodes to be distinguished from cancer of the eye?

A. The former commences in the central parts of the eye, is commonly incident to youth, and more destructive than the latter, which generally occurs in old age, and always makes its first appearance on the conjunctiva, or peripheral parts of the eye-ball; in fungus hæmatodes, the diseased eye is extremely soft, in cancer, peculiarly firm.

Q. How is fungus hæmatodes of the eye to be treated?

A. Extirpation of the diseased organ is the only remedy, and even this is often unavailing, however early it is had recourse to; if deferred until the last stage of the complaint, it then never fails to shorten the patient's life.

Q. Describe the operation of extirpation of the eye?

A. The patient being laid upon his back, and the eye-lids held asunder, a free incision is to be made at their temporal commissure, and the conjunctive tunic divided all round just where it begins to be reflected over the surface of the eye-ball; the surgeon then introduces through the tumour, a hook or ligature, with which he draws it aside in any direction, and proceeding from the lateral towards the mesial canthus, dissects the eye-ball from the socket, dividing first its coronal, and then its basilar attachments, and lastly, the optic nerve, and origin of the muscles of the eye. When the eye is removed, the orbit must be carefully examined, and all indurated and suspicious parts cut away; a piece of sponge should be inserted to repress the hemorrhage, and the eye-lids closed and covered with a compress and bandage; in a day or two the sponge should be withdrawn, a poultice applied, and inflammation obviated by the usual means.

Q. Enumerate the different parts divided in this operation ?

A. The tunica conjunctiva, the fat and muscles of the eye-ball, the levator palpebræ superioris, the ophthalmic artery and vein, the optic nerve, the third, fourth, first branch of the fifth and sixth pair of nerves, with several of their branches.

Q. Should not the lachrymal gland be removed ?

A. Invariably, whether it be in a sound or diseased state ; but the eye-lids should never be cut away, unless they have become contaminated.

DISEASES OF THE EAR.

Q. What are the principal diseases of the meatus auditorius externus ?

A. Inflammation, congenital or accidental imperforation, obstruction by foreign bodies or indurated cerumen, excessive secretion of cerumen, polypi or other excrescences, and herpetic ulceration.

Q. What are the symptoms of inflammation of the meatus auditorius externus ?

A. The patient complains of excruciating pain in the ear preceded by great tenderness upon pressure, the pain extends to the head, face and neck ; the lining membrane of the meatus looks red, and in a short time becomes so swollen, as completely to shut up the passage and occasion considerable deafness. These symptoms are generally attended with fever, and sometimes delirium.

Q. What are the causes of this affection ?

A. Cold, severe blows on the ear, extraneous irritating substances lodging within the canal, &c.

Q. How does it commonly terminate ?

A. Either in resolution or suppuration ; the discharge, in the latter instance, being thick, yellowish, and for the most part fetid.

Q. What is the treatment of this complaint?

A. In its onset, leeches, warm anodyne fomentations and emollient poultices, should be frequently applied to the ear, and blisters to the nape of the neck; purgatives should be freely administered, and quietude and low diet prescribed. In the suppurative stage, a ready exit for the puriform matter must be obtained, and the auditory canal frequently washed out by the injection of warm liquids, and carefully protected from cold.

Q. If the discharge becomes chronic, how must it be suppressed?

A. By the use of astringent injections.

Q. By what means are imperforations of the external auditory passage to be remedied?

A. When occasioned by a thin membrane, this should be divided by a crucial incision, and a sponge tent introduced through the opening, to keep it sufficiently dilated; the flaps ought to be cut away if possible, and this can always be effected, when the obstruction is situated near the outer orifice of the canal.

Q. How should the obstruction be removed when it lies very near the membrana tympani?

A. In this case, it should be destroyed by the application of caustic, as it would be almost impossible, if we employed a knife, to avoid wounding the membrane of the tympanum, and if even this did escape, a tent could not be inserted to obviate the reunion of the divided parts.

Q. What plan would you adopt, when the meatus auditorius externus is nearly or altogether obliterated?

A. A trocar of about the same length as the passage, should be pushed quite through the obliterated part, and then a tent introduced to prevent adhesion of the sides of the opening, and to preserve its proper diameter.

Q. When the meatus auditorius externus is preternaturally contracted, what should be done to relieve it?

A. If the contraction depend upon a thickening of the soft parts, this should be removed by the application of escharotics, or the passage gradually dilated by inserting into it firm sponge tents; if it be the result of malformation of the bone, it is incurable.

Q. How are insects and other foreign bodies to be extracted from the ear?

A. In the following manner; the patient being placed on a low seat, and in the direct rays of the sun, the surgeon raises the auricula coronad and iniad, in order to render the external meatus straight, and allow the light to pass to its mesial extremity; he then introduces a pair of very slender forceps, and extracts the exotic body.

Q. If we fail in removing a live insect in this way, what must be done?

A. Almond oil should be dropped into the external auditory tube, so as to suffocate the animal, which may then be washed out by the forcible injection of warm water.

Q. How is the removal of hardened cerumen to be accomplished?

A. By repeatedly, and with a tolerable degree of force, injecting six or seven ounces of warm water at once into the external meatus.

A. When the secretion of cerumen becomes excessive, how is it to be checked?

A. By the frequent injection of astringents, as decoction of oak bark, solutions of the extract of kino, or of sulphate of zinc.

Q. How are polypi or other excrescences to be removed from the external meatus?

A. If they be firm and have a narrow base by ligature; if soft and the base be broad, they should be destroyed by forceps and nit. argent. When they are situated near the lateral opening of the tube, they are easily cut away with a bistoury.

Q. How is herpes of the meatus auditorius externus to be cured?

A. The external remedies are injections, containing solutions of sulph. zinci and oxymen. hyd. and the ung. nit. hyd.; the internal are, small dozes of pil.

hyd. and gentle aperients, administered, in order to remove the deranged state of the digestive organs, upon which, this affection commonly depends.

Q. What are the chief diseases of the tympanum or middle ear ?—

A. Inflammation, preternatural relaxation or tension of the membrana tympani, and obstruction of the eustachian tube.

Q. What are the symptoms of inflammation of the tympanum ?

A. Agonizing throbbing pain in the ear, accompanied with severe head-ache, deafness, a sensation of roughness about the guttural aperture of the eustachian tube, fever and delirium. The inflammation sometimes extends to the brain and occasions death; if it terminate in resolution, the symptoms gradually subside and the hearing returns; if in suppuration, which it usually does, the membrana tympani ulcerates, the bones of the ear are discharged along with the offensive ichorous matter, fungous excrescences spring up in the external meatus, and the patient remains permanently deaf.

Q. What are the causes of this affection ?

A. Cold or inflammation of the fauces, especially that which occurs in scarlatina maligna, spreading along the eustachian tube into the tympanal cavity.

Q. How is it to be treated ?

A. By venesection, purgatives, anodyne fomentations and other antiphlogistic means; the discharge must be restrained by astringents, and the excrescences destroyed by forceps and caustic ?

Q. What symptoms indicate relaxation of the membrana tympani ?

A. This complaint is characterized by deafness, which grows worse during wet hazy weather, but is relieved in dry weather; its treatment consists in the use of blisters, stimulating and astringent applications.

Q. What are the symptoms of undue tension of the membana tympani ?

A. The hearing is so very acute, particularly in damp weather, that the lowest whisperings are sometimes intolerable; it is relieved by dry weather, purgatives, anodyne applications, and blisters.

Q. What are the causes of obstruction of the eustachian tube?

A. It is sometimes a congenital affection, but more commonly depends upon inflammation and intumescence of its lining membrane; an accumulation of thickened mucus the result of inflammation; the cicatrices of syphilitic or other ulcers in the throat; enlarged tonsils, or nasal polypi descending into the pharynx.

Q. By what indications do you ascertain, whether the deafness arises from obstruction of the eustachian tube or not?

A. We conclude that it does proceed from this cause, when the external meatus is discovered to be in a healthy and natural condition, when the patient can distinctly hear the sound of a watch placed between his incisor teeth, when no crackling and sense of fulness are perceived in the ear on forcibly blowing the nose, when the deafness has succeeded some inflammation or ulceration of the fauces, when these appear malformed, or the tonsils enlarged.

Q. How can obstruction of the eustachian tube produce deafness?

A. The use of the eustachian tube is to convey atmospheric air from the mouth into the tympanal cavity, which requires to be constantly filled with the elastic fluid, in order that the sense of hearing may be perfect; when this tube is obstructed, deafness of course ensues, which can only be removed, either by destroying the obstruction or puncturing the membrana tympani, and allowing the air to enter the tympanum from the external meatus.

Q. In what manner is obstruction of the eustachian tube to be removed?

A. When it depends upon a collection of viscid mucus, it may be removed by the injection of warm water; when it is permanent, it is irremediable, and the deafness which it occasions can only be relieved by puncturing the membrana tympani.

Q. How do you ascertain when the obstruction is permanent, and, when temporary?

A. We conclude that it is permanent, when it is congenital or consequent to extensive ulceration of the fauces; and temporary, when it has been preceded by a common cold.

Q. Describe the mode of injecting the eustachian tube?

A. After the patient is placed on a low seat and his head reclined backwards, a slender silver tube somewhat curved towards its extremity, should be passed along the floor of the nostril, with its convexity directed coronad; as soon as it has reached the posterior nares, the convex part must be turned towards the septum nasi, and its point gently pushed into the mouth of the eustachian tube. Warm water is then to be frequently injected by means of Anel's syringe.

Q. Describe the operation of puncturing the membrana tympani?

A. The patient being seated in a clear light, and the auricula pulled coronad by an assistant, a small trocar is to be introduced along the external auditory passage, and carefully pushed through the membrana tympani at its antinial part; as soon as the instrument has entered the tympanum, it must be twirled between the finger and thumb, in order to lacerate the fibres of the membrane, and thus prevent the puncture from healing up.

Q. By what circumstances is this operation rendered unsuccessful?

A. By the perforation being made too small and soon closing again, by its being made too large and the malleus displaced, by the lining membrane of the tympanum being wounded and becoming inflamed and ulcerated, or by the deafness arising from other causes besides obstruction of the eustachian tube.

Q. What are the diseases of the labyrinth or internal ear?

A. Malformation, inflammation of its lining membrane, extraneous matter contained in it, deficiency or complete loss of the liquor cotunni, and insensibility of the auditory nerve.

Q. What are the symptoms of deafness arising from loss of sensibility in the auditory nerve?

A. The secretion of cerumen is diminished, the patient complains of various noises in the ear, and is nearly or altogether insensible to the ticking of a watch put between his teeth, or to the side of the head.

Q. What are the causes of insensibility of the auditory nerve?

A. Organic disease, tumours pressing upon it, lesion of the brain, determination of blood to the head, disordered state of the chylopoïetic viscera, fevers, and exposure to loud sounds.

Q. How is nervous deafness to be treated?

A. When it arises from the three first causes, it is generally incurable; when it depends upon a plethoric state of the blood-vessels of the brain, bleeding both general and topical, purgatives, low diet, blisters and cold applications to the head, should be had recourse to; when upon derangement of the digestive organs, pilul. hydrarg. gentle purgatives, bitters, exercise and nutritious diet are to be prescribed; when it is produced by intense sound, or other causes inducing atony of the auditory nerve, blisters should be applied behind the ear, and ether dropped into the external meatus audit.; electricity and galvanism are also to be employed.

DISEASES OF THE NOSE.

Q. What are the principal surgical diseases of the nose?

A. Hemorrhage, polypus and ozæna.

Q. What are the symptoms of epistaxis, or nasal hemorrhage?

A. It is generally preceded by itching in the nostrils, pain, heaviness, or sense of fulness in the head, flushing of the face, throbbing of the temporal arteries, ringing in the ears, quick pulse, and sometimes universal shiverings.

Q. What are the causes of epistaxis ?

A. Insolation, coughing, violent muscular exertion, various emotions of the mind, &c. blows upon the nose or forehead, and in peculiar idiosyncrasies smelling at pungent or odoriferous substances.

Q. Is it ever attended with danger ?

A. Yes ; when it is profuse, or occurs frequently in debilitated, or, aged individuals, or when it takes place in the last stage of typhoid fevers.

Q. When does epistaxis prove beneficial, and require caution in attempts to suppress it ?

A. When it occurs in young, vigorous and plethoric individuals ; when it seems to prevent a fit of apoplexy, epilepsy or mania, or to terminate an attack of inflammation of the brain.

Q. How is nasal hemorrhage to be suppressed ?

A. By placing the patient erect, and in a cool situation, keeping the head constantly wet with cold evaporating lotions, and introducing astringents or tents covered with powdered charcoal into the nostrils ; if the hemorrhage be of the active kind, and connected with a plethoric state of the system, bleeding from the arm or temples will be necessary.

Q. If these means fail to check it, what must be done ?

A. A piece of waxed silk must be conveyed by means of a slender probe through the bleeding nostril into the fauces, and then by a pair of forceps brought out at the mouth ; to the extremity of the ligature a dossil of lint must be fixed, which, after being carried on the point of the finger towards the velum of the palate, should be drawn up into the posterior nares ; the anterior nostril should also be plugged up with lint ; as soon as the hemorrhage has ceased, the tents are to be withdrawn.

Nasal Polypus.

Q. What are the symptoms of nasal polypus ?

A. Nasal polypus, is a pyramid-like fleshy excrescence, generally situated near the root of the nose, and arising by one or more roots from the schneiderian membrane; in its commencement it is seldom attended with pain; as it increases in size it gradually descends into the fauces or nostrils, affects the speech, impedes respiration and swallowing, and destroys the smell; after a short time, it compresses the lachrymal sac, and closes up the mouth of the eustachian tube, in consequence of which, the eye becomes watery and the hearing diminished; the tumour at length enlarges to such an extent as to occasion the most violent headache, stupor, and a dreadful feeling of distension; the nose is swollen and displaced, and the whole countenance turgescent and distorted; from the extreme pressure, the bones composing the nasal cavity become carious, a fetid, ichorous, bloody matter flows from the nostrils, excessive and repeated hemorrhages come on, and the patient expires.

Q. How many kinds of polypus are there?

A. Two; the soft and the firm.

Q. What are the characters of the first or soft kind?

A. They are of a pale red colour, never affected with pain, not even when handled; compressible, easily broken, and discharge a transparent lymph; their size diminishes, and they are retracted within the nostril during dry weather, but become elongated during damp weather, they are not attended with danger, but, owing to their obstructing breathing and deglutition, create great inconvenience.

Q. What are the diagnostic symptoms of the firm polypus?

A. A firm polypus is very vascular, of a deep red colour, very painful from its first commencement, incompressible, tough, not affected by changes in the weather, often attended with caries of the nasal bones, and an offensive discharge from the nostrils; is very apt to return after removal, or to become cancerous.

Q. What are the causes of polypi?

A. Repeated attacks of catarrh, local injuries, a morbid state of the constitution, and relaxation of the mucous membrane of the nostrils.

Q. How is polypus to be treated ?

A. The soft kind, which depends principally upon a relaxed state of the schneiderian membrane, may, in the early stage, be impeded in its growth, or even dispersed by astringent injections and solutions of muriate of ammonia ; but when it has increased to a large size, it requires, as well as the firm polypus, an operation for its removal.

Q. How many modes of destroying nasal polypi are there ?

A. Four ; extraction, ligature, excision and caustic.

Q. Under what circumstances, is it supposed, the extirpation of a nasal polypus would be dangerous or unadviseable ?

A. When the polypus is of the firm or scirrhous kind, and attended with severe head-ache ; when it occasions great pain during coughing or sneezing, bleeds profusely or becomes painful when slightly touched, or, occupies a large extent of the nasal lining ; when a probe cannot easily be passed round its lower part, for some height up within the nostril, and, when it discharges a fetid and bloody matter.

Q. When is an operation most easily accomplished, and most successful ?

A. When performed on a soft polypus.

Q. Describe the operation of extraction ?

A. The patient being seated, and his head reclined backwards, the polypus must be propelled down into the nostril, by closing the mouth and forcibly blowing the nose ; it should then be separated as much as possible from its adhesions, by means of a thin flexible spatula, and after this is withdrawn, firmly grasped by a pair of polypus forceps and twisted from its root. As soon as the operation is performed, the nostrils should be examined, and if another polypus be discovered, it ought immediately to be extirpated. If bleeding follow the extraction of the tumour, it must be suppressed by the means already recommended for nasal hemorrhage.

Q. If the polypus break under the blades of the forceps, and only a portion of it be extracted, what must be done?

A. The hemorrhage which occurs in such a case and often proves dangerous, must be checked by immediately again laying hold of the tumour, and twisting it from its attachments.

Q. If the polypus hang more into the throat than the nostril, how should it be extracted?

A. It should be grasped by a pair of curved forceps conveyed along the mouth, and behind the veil of the palate, and then pulled away as close to its root as possible. If the polypus project equally into both the fauces and nostril, the nasal portion should be first removed.

Q. What are the dangers attending the operation of extraction?

A. Hemorrhage and inflammation; and when the operation is not dexterously performed, the delicate nasal portion of the ethmoid bone may be brought away, or large pieces of the schneiderian membrane detached.

Q. To which kind of polypus is extraction most applicable?

A. To the soft kind.

Q. How is the ligature to be applied?

A. In the following manner: after the patient is seated and the polypus detached from its adhesions, a silver wire should be passed round its root and then drawn tight; by the constriction, the tumour at first is rendered very painful and inflames; at length, it mortifies and drops off. The ligature is best adapted to the firm polypi, particularly when these project into the fauces; it is difficult of application, and frequently occasions extensive inflammation of the nasal cavity, ear, and throat, accompanied with violent symptomatic fever.

Q. Describe the operation of excision?

A. The patient being placed as for extraction, and the polypus brought down as low as possible, a blunt curved or sheathed knife must be introduced high up the nose, and then made to detach the tumour close to its root. The hemorrhage which generally happens after excision, should be restrained by the usual means.

Q. How is caustic to be applied?

A. After the patient is seated, the polypus should be laid hold of, and in some degree squeezed and contused by the blades of a pair of forceps; the blood and mucus should then be wiped away from the nostril, and a caustic bougie introduced and applied every second day, until the tumour is quite destroyed.

Q. To what species of polypus should caustic be employed?

A. To the small and soft species. The actual cautery is the best method of destroying nasal polypi, that are much disposed to bleed.

Ozæna.

Q. Give a description of ozæna?

A. Ozæna is an ulcer of a malignant character, situated within the nose; it commences with slight inflammation about the alæ nasi, accompanied with sneezing, increased flow of mucus and sometimes, hemorrhage from the nostrils; the ulceration soon spreads from the schneiderian membrane to the nasal cartilages, and if not checked, affects the bones; a thin offensive matter, which excoriates the lips and throat, is then constantly discharged from the diseased parts, and the sense of smell abolished; at length the inferior spongy bone and the vomer, and sometimes with these the palate and superior maxillary bones exfoliate, the cavity of the nose falls in, and the countenance is hideously deformed.

Q. What are the causes of ozæna?

A. It is induced by a scrophulous or syphilitic state of the system.

Q. What is the treatment of ozæna?

A. The surgeon should first have recourse to warm fomentations and poultices in order to reduce the inflammation; he should then apply to the ulcer, solutions of oxymur. hyd., sulph. cupri. or nit. argent., diluted sulphur. acid and the ung. nit. oxyd. hyd. and insert lint up the nostril, to absorb the discharge; during the employment of these local remedies, he should give preparations of mercury in conjunction with antimony, nitric acid, cinchona and light nutritious diet.

DISEASES OF THE ANTRUM.

Q. What are the diseases of the antrum highmorianum?

A. Abscess, various kinds of tumours, insects and foreign bodies lodging in it.

Q. What are the symptoms of abscess of the antrum?

A. It begins with severe pain in the cheek, which is often mistaken for tooth-ache, and extends to the nose, eye, and forehead; in a short time, the cheek becomes swollen, red, extremely hard and tender to the touch; when the head is laid on the sound side, pus is generally discharged at the nostril; the cheek at last ulcerates, the molares become loose and drop from their sockets; if a free exit for the matter be not obtained, the walls of the antrum grow carious and the breath is rendered intolerably offensive.

Q. What are the causes of this disease?

A. Blows upon the cheek, protrusion of the fangs of the teeth into the antrum, caries of the teeth, inflammation of the nostrils, and perhaps obstruction of the natural opening of the sinus into the nose.

Q. How is it to be treated?

A. An opening should be made into the antrum, and the matter evacuated as soon as possible, and this may be effected, by first extracting the third or fourth molaris, and then pushing a curved trocar through the apex of the socket; after the purulent fluid is discharged, warm water should be injected into the antrum, and when the inflammation has subsided, solutions of sulph. zinci. or lime water must be employed in its stead. To prevent the food from entering the sinus, a piece of sponge tent must be introduced into the artificial orifice.

Q. If the antrum cannot be opened at the lower part, in consequence of the sockets of the grinder teeth being obliterated, or the necessity of removing loose pieces of carious bone, what plan must be adopted?

A. In these circumstances, the lining membrane of the cheek must be freely detached from the bone, and a perforation made through the anterior parietes of the antrum, just above the alveolar process at the root of the third molaris.

Tumours in the Antrum.

Q. When are tumours known to exist in the antrum?

A. The patient first complains of pain in the cheek, which gradually becomes more violent, and is at length succeeded by a sense of fulness in the face; as the tumour enlarges, the sides of the antrum are pushed out in all directions; the nostril of the affected side is filled up, and excessive hemorrhages frequently take place from it; the cheek becomes swollen and excoriated by the tears flowing over it, the orbitar plate of the superior maxillary bone is raised up and the eye-ball made to project from the orbit; the roof of the mouth is depressed towards the tongue, the molares are dislodged, and fungi spring up through their sockets; the whole countenance grows deformed, caries at last affects the bones, an offensive matter is discharged from the nostrils, the constitution sinks under the excessive pain and irritation, and the patient dies a miserable death.

Q. How are tumours of the antrum to be removed?

A. In the following manner; a longitudinal incision extending from half an inch below the edge of the orbit to the commissure of the lips, should be made completely through the skin and muscles of the face down to the bone; the soft parts should next be dissected back, and when the surface of the glabellar or anterior wall of the antrum is fairly exposed, a portion of it must be cut out by the crown of a trephine; the tumour should then be removed with a scalpel; after which, the cavity of the sinus ought to be well seared with the actual cautery, which has the effect of preventing hemorrhage and a recurrence of the disease.

Q. How are insects in the antrum to be removed?

A. By the repeated injection of oil and warm water.

DISEASES OF THE LIPS.

Q. Mention the principal diseases of the lips?

A. Malformation or hare-lip, excrescences, ulcers, and cancer.

Q. What is meant by hare-lip?

A. When either one or both lips are divided by a fissure, the disease is termed hare-lip; the fissure is generally longitudinal and in a line with the septum nasi; occasionally it is opposite one of the nostrils, sometimes even continued into this part, and then the alæ nasi of the affected side is expanded, and appears much flatter than its fellow; in some instances, there are two fissures having a small lobe of the lip hanging between them; articulation for the most part is very indistinct, and the process of sucking performed with great difficulty.

Q. Is not hare-lip sometimes complicated with a division of the palate?

A. A division of the bones and other parts composing the palate occasionally accompanies hare-lip, principally the double kind; and in some examples extends as far as the uvula; when the palate is cleft, there is generally a projection of the alveolar process of the superior maxillary bone, and of one or two of the incisor teeth.

Q. Is the substance of the parts in hare-lip only divided or quite wanting?

A. Hare-lip consists merely in a division, not in a deficiency of the parts composing the lip.

Q. In which lip does this affection most commonly appear?

A. In the upper one; it very rarely occurs in the lower lip, but as the result of accident.

Q. Describe the operation for hare-lip?

A. The patient being seated on a low chair, and the projecting teeth carefully extracted, his head must be reclined on the breast of an assistant, who stands behind, pushes forward the cheeks, and at the same time compresses with his fingers, the facial artery on each side as it mounts over the edge of the lower jaw; the surgeon then stretches the lip on a piece of thin wood, and with a scalpel cuts off the edges of the fissure; he next brings the bleeding surfaces together, and accurately uniting them by the interrupted or twisted suture passed more than two-thirds through the thickness of the lip, secures the whole by compress and bandage.

Q. Should the projecting alveolar process be removed?

A. By no means; because after the fissure is united, the projection gradually diminishes, and if the operation be performed when the patient is very young, even the cleft in the palate also closes up.

Q. Should the pendent lobe in double hare-lip be cut away?

A. If it be very small it certainly must; if not, it should be allowed to remain, its edges carefully cut away, and then united to the other portions of the lip.

Q. Which part of the divided lip should first be brought into contact?

A. The red part.

Q. What artery is divided in the operation for hare-lip?

A. The coronary artery, which is a branch sent off, at the angle of the mouth, from the facial or external maxillary.

Q. Is not the operation when performed on young infants sometimes followed by dangerous results ?

A. Yes ; it is occasionally the cause of convulsions, when performed in very early infancy.

Q. How are tumours and ulcers of the lips to be treated ?

A. The former should be removed by excision, ligature or caustic; the latter, as they depend upon different causes, require different modes of treatment ; when they are produced by the constant irritation of a rough or carious tooth, this should be extracted or filed down ; when they arise from a less obvious cause, or from a faulty state of the constitution, cicuta and arsenical preparations, in conjunction sometimes with aperients or opium, are the best remedies.

Cancer of the Lip.

Q. Give a short description of cancer of the lip ?

A. Cancer of the lip sometimes commences with a small ulcer, which at first appears benign, but afterwards assumes a malignant character, and ultimately extends over and destroys the whole lip ; sometimes it begins in the form of a small pimple or wart-like excrescence ; this, after remaining indolent perhaps for years, at length, owing to some irritating cause, grows painful and then ulcerates ; the ulcer spreads wider and wider, its edges are indurated, and it discharges in great abundance, a dark coloured fetid matter ; if not extirpated, it consumes the whole lip, the saliva involuntarily escapes from the mouth, and excoriates the chin, the glands of the neck become swollen, and the patient presents a most shocking spectacle.

Q. How is cancer of the lip to be treated ?

A. It should be removed by an operation similar to that for hare-lip ; a triangular portion of the lip, including the whole of the disease, must be cut away, the edges of the wound brought into accurate contact and then secured by ligature, or the twisted suture; if the glands of the neck be contaminated, the operation generally proves unavailing.

Q. If the cancerous affection extend over the whole lip, how should it be extirpated?

A. In this case, the affected parts should be dissected away by an incision of a semilunar form, extending the whole length of the lip, and the wound healed by granulation.

DISEASES OF THE TONGUE.

Q. What are the diseases of the tongue?

A. Preternatural enlargement, wounds, inflammation, tumours, ulcers, cancer, adhesion to the bottom of the mouth, and malformation of the frænum.

Q. What treatment ought to be adopted in cases of preternaturally enlarged tongue?

A. If the malformation interfere much with mastication, deglutition or speech, a portion of the enlarged organ must be cut away, and the vessels tied; if it occasion but little inconvenience an operation will be unnecessary.

Q. How are wounds of the tongue to be treated?

A. If deep, they should be closed by a suture, the tongue kept still, the lower jaw secured by a bandage, and the patient fed upon liquids. Wounds of the tongue are, for the most part, produced by the teeth, generally transverse and situated nearer the apex than the root.

Q. How is inflammation of the tongue to be cured?

A. This affection is generally attended with such enormous swelling, that the patient is incapable of speaking and swallowing, and sometimes even of breathing; it should be relieved by making two or more longitudinal incisions along the dorsum of the tongue; by opening one or both of the ranine veins, if this be practicable; and by applying leeches and blisters to the throat. If the inflammation terminate in suppuration, the mouth must be frequently washed with demulcent fluids, while the throat is kept constantly covered with warm emollient poultices; if in mortification, it must be treated agreeably to the method already recommended.

Q. What are the causes of inflammation of the tongue?

A. Foreign bodies lodging in it, salivation, wounds, &c.

Q. How are tumours of the tongue to be removed?

A. The patient being seated and his head secured, the tumour must be laid hold of by a tenaculum, and then dissected out with a scalpel.

Q. What are the causes of ulcers on the tongue?

A. The friction of a rough or projecting tooth, derangement of the chylopoïetic viscera, syphilis, improper use of mercury, &c.

Q. How are they to be treated?

A. When the cause is considered, the treatment will be apparent; opium exhibited in large quantities has sometimes succeeded in healing ulcerations of the tongue where every other measure has failed.

Q. What are the symptoms of cancer of the tongue?

A. This disease first presents itself in the form of a small scirrhous tumour, or of several minute hard tubercles situated near the edge or apex of the tongue; these become painful and at length break out into ulcers, which are surrounded by a hard dark-coloured base, and discharge an offensive sanies; in the progress of the complaint the lymphatic glands of the neck are affected and inflame.

Q. By what means is cancer of the tongue to be extirpated?

A. Either by ligature, excision, or the actual or potential cautery. The first is applied by passing through the tongue a needle armed with a double ligature, a part of which must be made to include each side of the diseased mass.

Q. Describe the operation of excision?

A. The patient being seated on a chair and his mouth kept open by a piece of wood put between the molar teeth, the surgeon seizes the tongue with a pair of forceps or a tenaculum, and pulling it forward, cuts out the cancerous portion by means of a scalpel; he then ties the vessels or restrains the hemorrhage by the application of the actual cautery; after the operation, the tongue must not be moved, and the patient desired to live on liquid food.

Division of the Frænum Linguæ.

Q. How is the frænum linguæ malformed?

A. Sometimes it is continued to the very extremity of the tongue, the motions of which are thereby greatly limited; sometimes it is too short, confining the organ to the bottom of the mouth, in both cases, it ought to be carefully divided by a pair of blunt pointed scissors.

Q. What are the dangers attending this operation?

A. The ranine arteries and veins may be wounded; and dangerous, if not fatal hemorrhage ensue; should the frænum be too extensively divided, the tongue may fall backward into the throat and cause suffocation.

Q. In what manner is hemorrhage from the raninal vessels to be checked?

A. In the following manner; the surgeon takes a rounded piece of whalebone of a proper length, and splits it to the extent of eight or ten lines; he then separates each side a little asunder so as to form two prongs, and give the whole the appearance of a common hayfork; having wrapped it well round with soft linen, in order to prevent any injurious consequences arising from its pressure and to obviate its further division, he places it beneath the tongue with the prongs resting on each side of the frænum, while the handle is supported against the middle of the inial or posterior surface of the lower jaw; he then secures the tongue by a bandage passed over its dorsum, crossed under the chin and tied round the neck. By this contrivance, the blood-vessels are compressed and the hemorrhage checked.

Q. If this plan prove ineffectual, what means should be had recourse to?

A. The lingual artery should be exposed and tied where it passes over the corner of the os hyoides.

Q. Describe the course of the lingual artery?

A. The lingual artery is the second branch sent off from the external carotid; it runs near the pharynx, then over the corner of the os hyoides to the inial aspect of the mylohyoideus, and is distributed on the tongue, the fauces and muscles extending between the inferior maxillary bone and the larynx.

Q. By what means is the tongue to be prevented from falling backward into the pharynx?

A. A firm compress, formed of a piece of thin wood thickly covered with soft lint, should be laid upon it, and retained by means of a bandage.

Ranula.

Q. What is ranula?

A. Ranula is a bluish coloured tumour, of a round or oblong figure, situated beneath the tongue, and caused by an enlargement of the ducts either of the sublingual or submaxillary glands; it varies considerably in magnitude; when small, it is attended with no pain and little inconvenience; but when it acquires a large size, it increases the salivary secretion, raises up the tongue, turns its apex backward, and impedes deglutition and speech, and in some cases, by its pressure, forces out the teeth and destroys the lower jaw; it contains either a ropy transparent fluid, imperfectly formed pus, or earthy matter.

Q. What is the cause of ranula?

A. Ranula depends upon an obstruction of the mouth of the salivary duct, produced either by congenital imperforation, adhesion, or a collection of viscid saliva or calcareous matter.

Q. How is the cure of the ranula to be accomplished?

A. If the tumour be small, it should be opened by a free transverse incision, if large, it will be necessary to cut out the whole of its anterior part with a pair of scissors; its contents ought then to be evacuated, and the obstruction removed from the duct, by means of a small probe, or the repeated injection of warm water. Ranula sometimes bursts spontaneously and a cure is produced.

DISEASES OF THE TONSILS AND UVULA.

Q. What are the diseases of the tonsils?

A. Inflammation and its consequences, chronic enlargement, calculous substances contained in them.

Q. Describe the symptoms of inflammation of the tonsils or cynanche tonsillaris?

A. This disease is characterized by redness and swelling of the tonsils, accompanied with extreme pain in swallowing, difficulty of speech and respiration, dryness of the throat, thirst, foul tongue, flushed countenance, head-ache, deafness and fever.

Q. How is it to be treated?

A. The treatment of cynanche tonsillaris consists in scarifying the inflamed tonsils, in the employment of general and topical blood-letting, emetics, purgatives and diaphoretics, and in the use of gargles, and of blisters and rubefacients to the throat. If these means fail to afford relief, and suffocation be threatened, bronchotomy should be had recourse to without delay.

Q. When suppuration takes place, what plan of treatment should be adopted?

A. The vapour of hot water should be frequently inhaled, warm emollient poultices applied to the neck, and an early incision made into the abscess, for the discharge of the purulent matter.

Q. By what means are enlarged tonsils to be removed?

A. Either by ligature or excision.

Q. Describe the mode of applying the ligature?

A. If the projecting tonsil have a slender base, a piece of fine silver wire should be conveyed through the nostril into the throat, and then put round the tumour by a pair of forceps; this being effected, the ends of the ligature are next to be passed through a double canula, which should several times be twisted, in order to render the noose effectually constrictive. If the enlarged tonsil have a broad base, a double ligature must be introduced through its middle by means of a long needle; this being withdrawn, the ligature must be divided, and a part of it carried round the upper and under portions of the swelling.

Q. In what manner is excision to be performed?

A. The patient must be seated with his head reclining backwards, and his mouth kept open by a piece of wood or iron placed between the molar teeth; the surgeon then lays hold of the enlarged tonsil with a proper tenaculum, and drawing it forward from its situation, removes, by means of a scalpel, as much of its projecting part as he conceives necessary. The hemorrhage should be checked by cold astringent gargles, or the application of the actual cautery.

Q. Is there any danger attending this operation?

A. If the surgeon incautiously plunge his knife too deeply into the substance of the diseased tonsil, he runs great risk of wounding the external carotid artery, which is situated immediately behind the gland.

Q. What inconveniences are produced by elongation of the uvula?

A. When the uvula is elongated it excites coughing, vomiting, and a constant inclination to swallow by its coming in contact with the epiglottis and surface of the tongue.

Q. How is the removal of the elongated uvula to be accomplished?

A. The superfluous part should be taken hold of by a pair of long slender forceps, and cut away with scissors.

DISEASES, &c. OF THE NECK AND THROAT.

Wryneck.

Q. What is understood by wryneck ?

A. In this disease the head is bent obliquely towards either the right or left side ; the face is generally turned from the shoulder towards which the head is drawn, and the neck on the contracted side is harder and more bulky than the opposite one.

Q. By what causes is wryneck produced?

A. By a spasmodic affection of one of the sterno-cleido-mastoidei muscles ; by a permanent contraction arising from a difference in the length of these muscles; by a contracted state of the platysma myoides, or scalenus muscle ; by large cicatrices in the integuments of the neck ; by paralysis of the flexor muscles on one side of the neck, and by distortion of the cervical vertebræ.

Q. How is the cure of wryneck to be accomplished?

A. When the disease depends upon spasm of one of the mastoid muscles, which is generally produced by inflammation or a violent strain, recourse should be had to friction, stimulating embrocations, antispasmodics and aperients ; when it arises from a permanent contraction of these muscles, on either side of the neck, caused by an inequality of their length, it can only be remedied by an operation, which consists in dividing the contracted fibres.

Q. Describe the mode of performing this operation ?

A. The patient being laid on a table, a transverse incision is to be made through the skin and platysma-myoides, so as to expose the clavicular portion of the mastoid muscle, which, after passing a director under it, should be divided by a probe pointed bistoury ; if necessary, the sternal portion must also be divided in the same manner; after the operation, the head should be drawn into a straight position by some mechanical contrivance.

Q. Is it not sometimes necessary to cut out a portion of the mastoid muscle?

A. This proceeding is occasionally requisite in certain inveterate cases of wryneck.

Q. What treatment is necessary in those examples of wryneck depending upon contraction of the platysma myoides, or upon cicatrices of the skin?

A. The contracted parts should be cautiously divided or removed, and the head brought into, and preserved in an erect posture by a well adjusted apparatus.

Q. How is wryneck arising from paralysis to be cured?

A. By the application of electricity, cold water, blisters, and other stimulating and tonic applications to the paralysed muscles, and by keeping the head in a straight position. Distortion of the cervical vertebræ may be relieved, if the bones be in a sound condition, by proper mechanical means.

Bronchocele.

Q. Describe the symptoms and progress of bronchocele or goitre?

A. Bronchocele is an enlargement of part or the whole of the thyroid gland. The swelling at its commencement is smooth, soft, elastic, and unattended with pain or discolouration of the skin; after it has existed some time it generally becomes irregular and acquires considerable hardness; sometimes it continues stationary, sometimes it increases to such a prodigious magnitude as greatly to deform the countenance, and produce impeded respiration, hoarse voice, violent head-ache and a varicose state of the subcutaneous veins of the neck.

Q. At what age does bronchocele most commonly occur?

A. About the age of puberty; it occasionally however, makes its first appearance at the more advanced periods of life.

Q. Whether does it more frequently attack males or females?

A. Females; particularly those who are weak and delicate.

Q. Can bronchocele be mistaken for any other kind of swelling?

A. It may be mistaken for abscess or aneurism.

Q. What appearance does the internal structure of the diseased thyroid gland present?

A. When examined it is found to consist of a number of oval cells varying in size, and containing sometimes a transparent viscid fluid, sometimes a solid substance.

Q. What are the causes of bronchocele?

A. Cretinism, innutritive diet, and a scrofulous state of the constitution. Bronchocele is endemic in some countries.

Q. What are the remedies employed for the cure of this disease?

A. The local are frequent and long continued friction, leeches, blisters, an ointment composed of iodine, or hydriodate of potash and axunge, and mercurial plaster; the general remedies are purgatives, pil. hyd. calomel, muriate of barytes, muriate of lime, burnt sponge, and iodine or hydriodate of potash given in doses of half a grain, three times a day.

Q. If these means prove ineffectual in dispersing the disease, what other should be tried?

A. If the tumour be very large, seriously affect the breathing, and occasion much inconvenience or pain, it ought to be extirpated; in doing which, the surgeon should remember to make his first incision through the integuments of sufficient extent to allow the subsequent dissection to be performed with greater facility; he should also be careful to tie each artery as soon as divided, and above all, to avoid injuring the numerous important parts with which the thyroid gland is surrounded.

Q. Enumerate the important parts situated in the vicinity of the thyroid gland?

A. In front, are numerous large veins; on each side are the common carotid arteries, internal jugular veins, par vagum and great sympathetic nerve; the superior thyroideal arteries are situated at the atlantal part, the inferior ones at the sacral part; on the dorsal aspect lie the trachea, œsophagus and recurrent nerves.

Q. If the extirpation of the thyroid gland cannot be accomplished, what relief can the surgeon afford to his suffocating patient?

A. In this case he should intercept the supply of blood to the swelling by tying the superior thyroideal arteries, which may be effected by making a suitable incision through the skin and platysma myoides at the mesial edge of the mastoid muscle, exposing the vessels and then passing a firm ligature round them; the operation is most applicable in aneurismal bronchoceles, in which cases it is generally followed by a considerable diminution in the size of the tumour; it is, however, not unattended with danger, and sometimes indeed, produces fatal results.

Foreign bodies in the Œsophagus.

Q. At what parts of the pharynx and œsophagus do foreign bodies generally lodge?

A. They are most commonly found situated in the isthmus faucium, or upper part of the pharynx; if they pass beyond this point, they rest either at the superior or inferior orifice of the œsophagus, generally at the latter, and rarely at the middle part of the tube.

Q. What are the dangerous consequences arising from the detention of foreign bodies in the pharynx?

A. If they be small, they occasion difficulty of breathing, pain and inflammation; if large, they produce instant suffocation by exciting spasms in the glottis.

Q. What are the effect of extraneous bodies fixing in the œsophagus?

A. When of considerable bulk, they gradually destroy respiration by pressing upon and obstructing the trachea; when sharp and angular, their presence gives rise to inflammation, which terminates in suppuration or gangrene.

Q. What practice must be adopted in cases of foreign bodies lodging in the pharynx or œsophagus?

A. If the body be engaged in the pharynx, which is easily ascertained by thrusting forward and pressing down the tongue, it should be removed by the fingers, or a pair of long curved forceps; if it be lodged in the œsophagus, and beyond the reach of the forceps, it should be extracted by means of a slender piece of whalebone, to the extremity of which a hook or several nooses of strong bristles are attached.

Q. If the extraneous body cannot by any means be extracted, how should the surgeon act?

A. He should push it down into the stomach with a probang, and if suffocation be threatened, this proceeding ought to be executed with as little delay as possible.

Q. Is it not a dangerous expedient, to push hard sharp pointed bodies into the stomach?

A. Undoubtedly, and ought never to be resorted to except in cases of the greatest emergency; for although innumerable instances are recorded of needles and similar bodies passing through the whole alimentary canal, and being discharged per anum, or piercing the coats of the bowels, traversing along various parts of the body and ultimately escaping at the surface, without producing one bad symptom; yet they occasionally become fixed in the intestines, and induce inflammation, convulsions and death.

Q. What is the most eligible mode of proceeding, when the foreign body can neither be extracted nor pushed down into the stomach?

A. If it excite no very urgent or dangerous symptoms, it may be allowed to remain until loosened by ulceration, when probably it may be ejected at the mouth; but if it fearfully interrupt respiration, it should be cut out or recourse had to bronchotomy.

Q. Describe the operation of pharyngotomy?

A. The patient must be seated in a chair with his head reclining backwards. An incision should then be made along the mesial or inner edge of the left mastoid muscle, commencing opposite the atlantal or superior border of the thyroid, and terminating on a line with the sacral or inferior border of the cricoid cartilage. As soon as the sheath of the carotid artery is fairly exposed, it should be drawn aside towards the shoulder; a long curved sonde á dard should next be conveyed through the mouth, and the point of its stilet made to penetrate the left side of the pharynx, which appears at the very bottom of the wound. The surgeon, then, ascertaining that no large artery lies in the way, fixes a bistoury in the groove of the stilet, and running it onwards, lays open the bag of the pharynx. After the foreign body is extracted, the incision must be healed by the first intention.

Q. What parts are divided in this operation?

A. The common integuments; the platysma myoides; the constrictor pharyngis inferior; a small part of the constrictores medius and superior; the palato-pharyngeus and the stylo-pharyngeus, where the fibres of these intermix with each other at the lateral part of the pharynx; and the membrane of the pharynx.

Foreign bodies in the Trachea.

Q. What symptoms are produced by foreign bodies lodging in the larynx or trachea?

A. Convulsive cough, rattling and pain in the throat, difficulty of respiration and hoarseness of voice, redness and swelling of the face, protrusion of the eyes, indescribable oppression, and sometimes emphysematous swelling of the neck.

Q. At what part of the wind-pipe do foreign bodies generally lodge?

A. In the opening of the glottis; in the ventricles of the larynx or in the trachea. Occasionally they descend into the bronchiæ. When fixed in the glottis they occasion the most violent symptoms and sometimes instant suffocation; when in the ventricles of the larynx or in the trachea the danger is not so immediate, the symptoms are generally intermitting, and death is produced in the course of a few days, by inflammation or effusion into the air-cells of the lungs. When foreign bodies pass down into the bronchiæ, they excite suppuration of the lungs, the termination of which is usually fatal.

Q. How are foreign bodies to be removed from the windpipe?

A. Sometimes they are expelled by the cough, and then either ejected from the mouth or unconsciously swallowed. For the most part however, their removal can only be accomplished by making an opening into the larynx or trachea. The former operation is termed laryngotomy, the latter tracheotomy.

Q. Describe the mode of performing laryngotomy?

A. The patient being laid on a table, with his head hanging over a pillow, the surgeon, by means of his left fore finger and thumb, fixes the larynx. He then makes a small incision exactly in the mesial line through the integuments situated over the crico-thyroid membrane, which he divides by a transverse incision, after having fairly exposed it by drawing aside the sterno-hyoidei and sterno-thyroidei muscles. If the extraneous substance lie in the rima glottidis, it must be pushed upwards into the mouth, by a probe. If it be lodged in the ventricles of the larynx, the whole anterior part of the thyroid cartilage should be slit open; if, in the trachea, it will be necessary to divide the cricoid cartilage. In some instances, the exotic body is expelled through the wound by the impetus of the expired air; in others, it requires to be extracted with the forceps.

Q. What important parts are liable to be wounded in this operation?

A. The chordæ vocales, and a large branch of the superior thyroideal artery.

Q. Describe the manner of performing tracheotomy?

A. The patient must be placed in the same position as in the operation of laryngotomy. The surgeon then fixing the trachea, begins his first incision a little below the inferior lobes of the thyroid gland, and continues it downwards, along the mesial line to the extent of two inches. As soon as he has divided the integuments, he separates the opposite muscles from each other, and after having laid bare the trachea, he cuts through two of its rings in a longitudinal direction. The opening may be enlarged, if necessary, by cutting towards the cricoid cartilage.

Q. What parts may the surgeon wound in performing tracheotomy ?

A. If he does not proceed with caution, he may wound the thyroideal veins, which are situated in front of the trachea ; or the carotid arteries which lie on each side of it; or the thyroid gland, which is placed a little below the cricoid cartilage ; or the subclavian vein, which runs just behind the atlantal border of the upper bone of the sternum.

Q. Whether is laryngotomy or tracheotomy generally to be preferred ?

A. Laryngotomy. Tracheotomy however is the most eligible operation when the larnyx is violently inflamed, or the impediment to respiration is situated below the crico-thyroid membrane.

Q. For what other motives, besides the extraction of foreign bodies from the wind-pipe, is bronchotomy performed ?

A. For the admission of air into the lungs, in cases of drowning, &c. or where the respiration has become obstructed, from angina or croup, from foreign bodies lodging in the pharynx or œsophagus, from wounds or tumours of the neck, or from swelling or enlargement of the tongue, tonsils, or neighbouring parts.

Q. By what contrivance can the artificial opening in the wind-pipe, when made for the admission of air into the lungs, be kept open ?

A. By cutting out a small portion of the cricoid cartilage or trachea, which is preferable to the introduction of a canula, the presence of which often occasions violent irritation and cough.

DISEASES &c. OF THE MAMMA.

Q. What are the principal diseases of the mamma?

A. Inflammation, abscess, scrofulous enlargement, sarcoma, scirrhus and cancer.

Inflammation of the Mamma.

Q. What are the symptoms of inflammation of the breast?

A. The part becomes red, hot, swollen, tense and painful. The patient, at the same time, is affected with symptomatic fever, more or less violent. When the inflammation extends to the mammary gland, the swelling is hard and irregular, and the secretion of milk is generally suppressed; but when it is confined to the integuments, the breast is uniformly enlarged, and the mammary secretion rarely becomes interrupted.

Q. What are the causes of this disease?

A. Disorder of the uterine or gastric system, exposure to cold, sudden repression of the flow of milk, mental emotions, external injuries, &c.

Q. How does it terminate?

A. Either in resolution or suppuration. When an abscess does form, it usually bursts near the nipple.

Q. How is inflammation of the mamma to be treated?

A. Endeavours should be made, in the onset of the disease, to bring about resolution by bleeding, warm saturnine lotions and fomentations, purgatives and spare diet. If the patient give suck, the milk should frequently be drawn away. When suppuration cannot be prevented, recourse should be had to warm emollient poultices, and the abscess either opened by a lancet or allowed to burst spontaneously. In chronic and deep seated mammary abscess, sinuses are apt to form, which require to be laid open and healed from the bottom.

Scrofulous enlargement of the Mamma.

Q. Describe the symptoms of scrofulous enlargement of the mamma?

A. In this disease, the breast is much increased in size, and when examined, presents a large moveable tumour situated immediately under the integuments, but not adherent to them; the skin is smooth and of its natural colour, and the patient complains of little or no pain. When the tumour is irritated, it grows painful and inflames; it then suppurates and discharges a thin serum mixed with curd-like matter.

Q. How is it to be treated?

A. In the first stage, attempts should be made to discuss the tumour by leeches, slight friction and the use of mild aperients and tonics. When the swelling becomes irritable and painful, warm fomentations and poultices, purgatives and light diet constitute the curative process.

Sarcoma of the Mamma.

Q. What are the distinctive characters of sarcoma of the breast?

A. In this complaint, the breast gradually enlarges and often attains a prodigious size. The tumour has a fleshy feel, and is exceedingly firm, heavy and insensible. While it is small it occasions little trouble, and the skin retains its natural colour; but when it becomes large, it creates great uneasiness; renders the subcutaneous venous branches varicose, and produces painful distension of the integuments.

Q. How is this disease to be remedied?

A. Extirpation affords the only means of cure.

Scirrhus and Cancer of the Mamma.

Q. What are the symptoms of scirrhus of the mamma?

A. This disease commences in the form of a small indolent moveable tumour, which gradually increases in size, and after some time becomes knotty and irregular on its surface, and adherent to the skin. When the scirrhus terminates in cancer, the tumour is affected with a pricking and burning sensation; at length, it grows very painful, the integuments assume a puckered appearance and the nipple is drawn inwards, the superficial veins daily enlarge, the skin turns livid, and at last ulcerates; the ulcer is deep and cauliflower like, and discharges a very offensive sanies; the axillary glands, after the lapse of a longer or shorter period, become tainted, the thoracic viscera next participate in the disease, and the patient dies.

Q. By what means are these diseases to be removed?

A. They can only be removed by extirpation.

Extirpation of the Mamma.

Q. Describe the usual mode of extirpating the breast?

A. The patient must be seated on a chair or laid on a table, with her arm raised to a right angle with the trunk of the body, and supported by an assistant. The surgeon then stretching the integuments, makes a semicircular incision at the under and outer part of the breast, extending in an oblique direction from the axilla downwards towards the sternum. This being done, he now makes at the upper and inner side of the mamma, another incision, similar to and joining the extremities of the former one. As soon as the external incisions are completed, the operator dissects the tumour from its surrounding connections, proceeding from the lateral or axillary, to the mesial or sternal angle of the wound, in the course of the fibres of the pectoralis major. The arteries should be tied as soon as divided, and, wherever the pectoral muscle has grown to the diseased mass, the adherent part must be cut away. The axillary glands ought to be carefully examined, and, if found to be enlarged and in a morbid state, removed. After the operation, the lips of the wound should be placed in accurate contact, and united by the first intention.

Q. What arteries supply the mamma with blood ?

A. Some of the external thoracic and branches from the internal mammary. The external thoracic arise from the axillary, the internal mammary from the subclavian artery. The mammary nerves are sent off from the axillary plexus and intercostals.

Q. What is the principal artery divided in the operation ?

A. The thoracica longa.

Q. How should the surgeon proceed in removing a diseased axillary gland ?

A. As soon as he has exposed it, he should be careful to pass a ligature round its artery, before cutting it away.

Paracentesis Thoracis.

Q. Describe the operation of paracentesis thoracis ?

A. The patient being seated with his head and shoulders reclining backwards, an incision two inches in length should be made upon the middle of the seventh or last true rib, half way between the spine and the sternum. The surgeon then dissects the integuments from the subjacent parts, and pulling them upwards towards the axilla, exposes the upper or atlantal margin of the rib, close to which, he divides the intercostal muscles, to the extent of half an inch. This being done, he passes the point of his scalpel just through the pleura costalis into the chest. The flap is now to be brought down over the wound, when a curved director must be passed beneath it into the cavity of the thorax, and the matter evacuated.

Q. Which is the most eligible plan of proceeding when a very large quantity of fluid is contained in the thorax ?

A. In this case it is better to evacuate only a part of the fluid, then to close the wound, and take away the remainder after a lapse of a few hours, than to discharge the whole quantity at once.

Q. What should be done after the fluid is discharged?

A. If it be blood or water, the wound should be healed by the first intention; if it be pus, the opening should be kept free by the introduction of a small tent, which at proper intervals must be withdrawn, in order that the matter may escape.

Q. What parts are divided in this operation?

A. By the first incision which is made a little below the inferior margin of the pectoralis major, the integuments and a few fibres of the external oblique, where that muscle intermixes with the digitations of the serratus magnus, are divided; by the second, the external and internal intercostals are divided; the third incision cuts open the pleura.

Q. Why is the surgeon directed to divide the intercostal muscles close to the upper edge of the rib?

A. In order that he may avoid wounding the intercostal artery, vein and nerve, which run in a groove at the inferior border of the ribs between the internal and external intercostal muscles.

DISEASES &c. OF THE ABDOMEN.

Paracentesis Abdominis.

Q. Describe the operation of paracentesis abdominis?

A. The patient being seated on a high chair, a large napkin should be applied round the upper part of the abdomen, and committed to the charge of an assistant. The surgeon then takes a straight trocar, and after smearing it with oil, pushes it with a slight rotatory motion through the linea alba, two inches below the umbilicus, into the abdomen. As soon as it has fairly entered, the stilet should be withdrawn, and the canula pushed further inwards. In proportion as the fluid escapes, the bandage must be tightened to compress the blood vessels and viscera, and prevent syncope. If a piece of lymph or omentum fall against the internal orifice of the tube and obstruct the current, it should be removed by the introduction of a blunt probe. After the operation, the canula must be taken away, the wound closed, and a flannel roller passed round the abdomen.

Hernia.

Q. What is understood by hernia?

A. Hernia is a preternatural tumour, occasioned by the protrusion of some of the viscera of the abdomen out of that cavity. In most cases, the displaced bowels are included in a bag derived from the peritoneum, which, in their descent, they push before them.

Q. What is this peritoneal covering termed?

A. It is termed the hernial sac, which surgeons have divided into mouth, cervix and fundus.

Q. What are those cases of hernia, which have no peritoneal covering?

A. Hernia of the bladder and hernia arising from penetrating wounds of the abdomen. Hernia of the cœcum receives only a partial covering from the peritoneum. Congenital hernia may be considered as having no peritoneal or hernial sac.

Q. In what situations does hernia most commonly appear?

A. As the viscera generally descend from the abdominal cavity through the natural openings, the groin, scrotum, labia pudendi, bend of the thigh, and navel are the most frequent seats of hernia. The situations next in frequency, are the vagina, perinæum, foramen ovale and sciatic notch. Hernial tumours also occur, in consequence of external injuries, at various parts of the abdominal surface.

Q. Are not herniæ divided into several varieties?

A. Yes. In consequence of their occupying different situations, they are divided into inguinal, scrotal, femoral, umbilical, vaginal, pudendal, perinæal, ischiatic, thyroideal, ventral and phrenic; and from their containing different kinds of viscera, into enteroceles, epiploceles and entero-epiploceles. Herniæ are termed congenital, when they exist from the time of birth.

Q. Explain the meaning of the terms enterocele, epiplocele and entero-epiplocele?

A. Enterocele implies that the hernial contents are intestine; epiplocele that they are omentum; and entero-epiplocele that they consist both of intestine and omentum.

Q. What viscera are the most frequently herniated?

A. The omentum, the small and large intestines.

Q. Are the other abdominal viscera ever found displaced?

A. Yes. The stomach, urinary bladder, liver, spleen, uterus and ovaria occasionally enter into the formation of hernial tumours. The pancreas and duodenum are never protruded.

Q. Whether are the small or large intestines most frequently herniated?

A. The former, in consequence of their occupying a more considerable portion of the abdominal cavity, and being less firmly fixed down by peritoneal ligaments, than the latter. The ileum, from its greater nearness to the inguinal ring, is more frequently protruded than the jejunum.

Q. Which portions of the large intestines are usually protruded?

A. The cœcum and the sigmoid flexure of the colon.

Q. Do the bowels, when they protrude, always escape at the openings opposite to which they are naturally situated?

A. This is generally the case, but sometimes the sigmoid flexure of the colon protrudes through the right abdominal ring, and the cœcum through the left; sometimes the ovary escapes at the umbilicus, and the liver has been known to form the contents of a femoral hernia.

Q. What are the predisposing causes of hernia?

A. The principal are general relaxation; large size of the natural openings of the abdominal parietes; and weakness of the edges of these openings. Pregnancy, ascites, relaxation of the peritoneum, and elongation of the mesentery and omentum have also been assigned as predisposing causes of the disease.

Q. What are the exciting causes of hernia?

A. The principal exciting cause, is the pressure, which the action of the diaphragm and abdominal muscles is constantly exerting upon the viscera contained in the belly. When there is a strong predisposition to hernia, as happens in children and aged people, the bowels are sometimes protruded by the slightest efforts, such as sneezing, coughing, crying, &c. or even by the act of ordinary respiration; but when the predisposition exists only in a very trifling degree, the protrusion does not take place, except under great bodily exertion, when the diaphragm and abdominal muscles are thrown into a state of violent contraction.

Q. Are hernial tumours sudden or gradual in their formation?

A. When they are produced by extreme bodily exertion, they appear very suddenly; but when they are the consequence of predisposition, or seem to take place spontaneously, their formation is very gradual. In the first instance, the opening through which the bowels escape is small, and there is great danger of strangulation; in the latter, the opening is large and free, and strangulation less liable to be produced.

Q. Describe the distinctive characters of hernia?

A. Hernia, for the most part, suddenly appears after some violent bodily exertion, and presents an indolent, soft, elastic swelling, which, in the recumbent position of the body, recedes spontaneously, or can easily be made to disappear by the application of pressure; but returns, as soon as the patient stands erect, and the pressure is removed. Its size is increased by holding the breath, or taking a large meal. A very perceptible impulse is communicated to it by coughing, and it is generally attended with vomiting, constipation, colic pains, and other symptoms, indicating a disordered state of the stomach and intestines.

Q. By what marks do you ascertain, whether the rupture be an enterocele, an epiplocele, or an entero-epiplocele?

A. An enterocele, that is, a hernia consisting entirely of intestine, for the most part takes place suddenly; it is smooth, elastic, rendered tense by coughing, or by holding the breath; and when pressed upon, returns all at once and generally with a gurgling noise. An epiplocele, or omental hernia is usually tardy in its formation, and has a flabby or doughy feel; its surface is uneven; it is not made tense, nor receives any impulse from coughing; it is more compressible, and when large, much heavier than enterocele; it recedes very gradually, and its reduction is unaccompanied with any gurgling noise. An entero-epiplocele, or a hernia composed both of intestine and omentum, is known by the first portion of its contents when pushed back ascending into the abdomen easily and with a gurgling noise, while the latter portion is reduced with greater difficulty and without any noise.

Q. In how many states does hernia exist?

A. In three; viz. the reducible, the irreducible, and the incarcerated or strangulated state.

Reducible Hernia.

Q. What is understood by reducible hernia?

A. A hernia is termed reducible, when the protruded viscera continue to perform their functions, create no pain, and can at any time easily be returned into the abdomen.

Q. In what manner is reducible hernia to be treated?

A. The surgeon should first replace the contents of the swelling within the abdomen, and secondly, preserve them in that situation by means of a truss or bandage.

Q. How is the first object to be accomplished?

A. By the following method. The patient must be placed upon his back, with his chest and pelvis well raised by pillows, so as to curve the trunk of the body. If the case be an inguinal or femoral hernia, the thigh must likewise be put into a state of flexion, and the leg rotated inwards. The surgeon then gently compresses the tumour, in order to diminish its bulk, and pushing up the protruded parts in the same direction in which they descended, he readily conveys them back into the cavity of the abdomen. This operation is termed the taxis.

Q. In what direction should the surgeon push, to reduce an inguinal, femoral, or umbilical hernia?

A. In a case of inguinal hernia, he should push upwards and outwards towards the os ilium; in femoral hernia, if the tumour be small, he should push first dorsad or backwards, and then atlantad or upwards; in umbilical hernia, directly dorsad or backwards.

Q. In what direction should the swelling in femoral hernia be pushed, when it has attained a large size and become reflected over Poupart's ligament?

A. In this case, it should be pushed first downwards towards the knee, and then backwards and upwards.

Q. What advantage is gained by placing the patient in the position above mentioned?

A. By elevating the chest and pelvis, the abdominal muscles, the psoas magnus and the iliacus internus are relaxed; and by rotation of the leg inwards, the tendon of the external oblique and the femoral fascia are also relaxed, in consequence of which, the apertures that these parts form, and that give passage to inguinal and crural hernia, are rendered less tense and resisting, and reduction of course more easily effected.

Q. Is the hernial sac capable of being returned into the abdomen along with the protruded bowel?

A. Only in very recent cases of the disease. In those of longer standing, it is so firmly united, in consequence of inflammation, to the other investments of the tumour, that it cannot be reduced.

Q. In what manner is the truss to be applied?

A. The patient being placed on his back, and the hernia reduced, the pad of the instrument, which should neither be too hard nor convex, and thicker at its lower than its upper side, must be applied directly over the opening through which the bowels have descended. In external inguinal hernia, it should cover both the superior and inferior abdominal apertures. The truss should be worn night and day, if possible; if this cannot be done, it may be taken off at nights, the patient being careful always to remove it after lying down, and to apply it before rising. If it be not properly adapted to the case, it produces pain along the spermatic cord, and inflammation of the testicle, and by not affording sufficient support to the parts, sometimes allows a portion of the intestine to descend behind the pad, by the pressure of which, it may become strangulated.

Q. Do trusses ever effect a radical cure of hernia?

A. Yes; they frequently do in the hernia of children; seldom in those of adults; never in the ruptures of old age. They produce this desirable result, more frequently, in recent accidental herniæ, than in old spontaneous ones; in inguinal, than in crural hernia.

Irreducible Hernia.

Q. Explain the meaning of irreducible hernia?

A. When the protruded bowels, in consequence of adhesions or their enormous bulk, cannot be replaced within the abdomen, and yet at the same time are free from constriction, the case is denominated an irreducible hernia.

Q. From what causes does hernia become irreducible?

A. The contents of a hernial tumour are rendered irreducible, by their contracting adhesions with each other, with their containing sac, or with the peritoneum just within the abdomen; by the omentum or mesentery becoming enlarged, fleshy, or loaded with fat; by the neck of the sac becoming thickened; by the protruded portion of intestine being filled with fæces or distended with air; and by the cavity of the abdomen suffering considerable diminution of capacity.

Q. How is irreducible hernia to be treated?

A. The most proper treatment to be adopted, is to obviate costiveness; to avoid violent exertion, and to support the tumour by a suspensory bandage. Some cases of irreducible hernia, are rendered capable of reduction, by long confinement to bed, spare diet, venesection, the use of purgative medicines, and by pressure on the tumour. This plan of treatment however cannot succeed, in those examples, where the protruded viscera have formed adhesions with the peritoneal sac.

Q. Is the reduction of old, large, irreducible hernia ever attended with unhappy results?

A. Yes. In some instances, vomiting, pain and other alarming symptoms, and in others, even inflammation and death have been produced, by the introduction of parts a long time herniated into the abdomen, the capacity of which has become diminished and rendered incapable of again receiving them.

Q. Would it not be prudent to lay open the tumour of an irreducible hernia, and return the displaced bowels into the abdomen?

A. By no means. This mode of practice has been tried, but found to be dangerous and even productive of fatal consequences.

Strangulated Hernia.

Q. What is meant by strangulated hernia?

A. Hernia is said to be strangulated, when the protruded parts are not only incapable of being returned into the abdomen, but are affected with constriction, pain and inflammation, accompanied with obstruction of the intestinal canal.

Q. What are the symptoms of strangulated hernia?

A. The tumour, besides being irreducible, is attended with considerable pain. The patient is affected with constipation, nausea, vomiting, fever and restlessness; the whole abdomen is painful, tense and swollen; the countenance expresses great anxiety, and the pulse is quick, hard and small. If the disease be not relieved, a most distressing hiccough supervenes, and the pain and fever become greatly aggravated, and continuing to increase in severity and violence for some time, at last suddenly cease. The patient now feels himself perfectly easy, the swelling and tension of the belly abate, the pulse is weak and interrupted, the tumour falls in, the integuments covering it turn soft and livid, and acquire an emphysematous feel; subsultus tendinum and delirium then come on, and death speedily ensues.

Q. What herniæ are most liable to become strangulated?

A. Small recent ones suddenly appearing after some feat of strength, especially when they occur in young vigorous men. The herniæ of adults are more readily strangulated than those of children. Spontaneous herniæ seldom suffer strangulation.

Q. Are all herniæ, when strangulated, attended with the same degree of danger?

A. No. Large old herniæ are less dangerous than small recent ones. Epiplocele than enterocele. Perinæal, vaginal or ventral hernia, than femoral, inguinal, or umbilical. A small strangulated portion of intestine is generally more perilous than a large portion.

Q. Why is a small hernia more dangerous than one of large bulk?

A. Because, when the protruded portion of bowel is small, as happens in the first instance, the opening through which it has escaped must also be small, and the constriction of course much greater than in cases of large hernia, where the aperture or ring is very considerable, and presses with but a moderate degree of force upon the displaced viscera.

Q. What is the immediate cause of strangulation?

A. The forcible pressure of the stricture on the protruded viscera.

Q. What parts form the stricture?

A. The stricture may be formed either by the neck of the sac; by preternatural adhesions in the body of the sac; by the tendinous opening through which the viscera have escaped; or by pieces of omentum becoming twisted round the intestine. In bubonocele, the stricture is sometimes formed by the lower margins of the transversalis and internal oblique muscles.

Q. What forms the stricture when a hernia arising from accident, becomes strangulated soon after its formation?

A. The tendinous opening through which the bowels protrude.

Q. What generally forms the stricture in old hernia?

A. The neck of the hernial sac.

Q. Explain in what manner, strangulation is produced?

A. As the opening through which the hernia descends, never spasmodically contracts, nor suffers any diminution from other causes, but always remains of the same diameter, and is entirely passive, it follows, that the protruded viscera must strangulate themselves, and this they do, in consequence of their bulk being increased. This augmentation of bulk, of course, is equivalent to a contraction of the diameter of the opening, and is produced in a variety of ways. For instance, when hernia suddenly caused by some violent muscular effort, becomes strangulated, the strangulation generally arises from the displaced parts thickening and swelling from inflammation. Secondly, strangulation of a chronic hernia, is occasioned by the magnitude of the tumour being increased by the descent of another portion of bowel, and if it be enterocele, by the intestine becoming distended with air, food, or fæces.

Q. Into how many kinds is strangulation divided?

A. Into two; the acute and chronic. The former occurs in the small, recent, sudden accidental hernias of young athletic adults. It is characterized by the inflamed, tense, and exceedingly painful state of the tumour, as well as by the extreme violence of the concomitant symptoms, which not unfrequently terminate fatally in a few hours. The second, takes place in the large ancient hernias of feeble aged individuals, and is commonly produced by an accumulation of the intestinal contents. In chronic strangulation, the tumour is hard, heavy, and attended with obtuse rather than acute pain, while the other symptoms proceed with less violence and rapidity.

Q. What is the cause of the constipation in strangulated hernia?

A. The constipation appears to arise more from inflammation of the bowels, than from the pressure of the stricture mechanically obstructing their course; as it is present in as insuperable a degree, whether only a part, or the whole of the circle of the intestine be strangulated.

Q. If inflammation of the bowels attack a patient labouring under a hernia, by what indications do you ascertain, whether it depends upon strangulation, or upon some internal cause?

A. When it depends upon the latter, the abdomen is painful, tense and swollen, while the tumour is soft and quite free from pain. The very opposite of this occurs, and the pain originates in, and spreads from the tumour, when the inflammatory affection arises from strangulation.

Q. What treatment should be adopted in cases of strangulated hernia?

A. The surgeon should first reduce the protruded and strangulated viscera by the taxis, and then obviate or subdue inflammation by bleeding, purgatives, warm fomentations, low diet, and other antiphlogistic means.

Q. Whether is a small or a large strangulated hernia most easy of reduction?

A. The latter. In the former example, the constriction, owing to the narrowness of the opening, is generally so violent, as to render the replacement of the protruded bowels very difficult.

Q. If the reduction cannot be accomplished by the taxis alone, what auxiliary means should be had recourse to ?

A. Venesection, purgatives, the warm bath, cold applications, and the tobacco glyster ?

Q. In what cases of strangulation is venesection most beneficial and proper ?

A. In those of the acute kind, when the hernia is small and recent, the abdomen painful, tense and swollen, and the patient young, vigorous and plethoric. The blood should be taken away very rapidly and in great quantities, so as to induce a state of syncope and general relaxation, during which, reduction by the taxis must again be attempted.

Q. But may not bleeding sometimes be employed with advantage, in aged individuals, and when the strangulation is of the chronic kind ?

A. Yes, to a moderate extent ; although not so much with a view of aiding manual reduction, as of preventing inflammation.

Q. When is the warm bath of the greatest utility ?

A. When it is employed in the early stage of strangulation. Its operation is greatly assisted by the use of opiates.

Q. How does the warm bath prove beneficial ?

A. The general relaxation and fainting which it occasions, greatly conduces to the success of the taxis, which should be tried while the patient is immersed.

Q. When are purgative medicines most useful and proper ?

A. In strangulated omental hernia. Their administration should always be conjoined with bleeding and the warm bath.

Q. In what other cases may they be employed ?

A. In very ancient and large intestinal hernias, when the strangulation has been caused by an accumulation of fecal matter. Even in examples of this kind however, they may prove hurtful, if any inflammation be present.

Q. In what cases of strangulated hernia, are purgative medicines always decidedly injurious ?

A. In recent intestinal ones; especially when the strangulation is of the strictly acute kind.

Q. What is the most eligible mode of applying cold, in strangulated hernia ?

A. That of placing cold applications, in the form of ice or solutions of nitre and muriate of ammonia, directly on the tumour itself. The cold bath is an uncertain remedy, and therefore seldom prescribed.

Q. Upon what principle, are tobacco glysters recommended in strangulated hernia ?

A. On the principle of their producing in the whole system a state of extreme depression, during which, the protruded parts either retire spontaneously, or may easily be reduced by the taxis.

Q. In what form, are tobacco glysters to be administered ?

A. Either in the form of smoke or infusion. The latter is generally preferred, and made by macerating for ten minutes, a dram of the leaves of Nicotiana Tabacum, in a pint of boiling water.

Q. How long should the surgeon persist in trying the taxis and its auxiliary means ?

A. No precise directions can be given with regard to the length of time that must be consumed in trying the preceeding measures. The surgeon should be guided entirely by the degree of violence which the symptoms assume ; and whenever the abdomen becomes distended and tender to the touch, and the tumour itself is hard and painful, he should not delay a moment performing the operation, which consists in laying open the hernial sac and dividing the stricture.

Inguinal Hernia, or Bubonocele.

Q. What are the symptoms of inguinal hernia ?

A. The disease is indicated, by the appearance of a small indolent tumour at the groin, which is capable of being returned into the abdomen, and possesses the other diagnostic characters of hernia already given.

Q. On which side, does inguinal hernia most frequently present itself ?

A. On the dextral or right side.

Q. What viscera are generally protruded in inguinal hernia ?

A. The small intestines.

Q. What diseases may be mistaken for bubonocele ?

A. Hydrocele of the tunica vaginalis testis, encysted hydrocele of the spermatic cord, cirsocele, hæmatocele detention of the testicle at the abdominal ring, bubo, lumbar abscess, hernia humoralis, and femoral hernia.

Q. By what marks, can the surgeon distinguish hydrocele of the tunica vaginalis, from inguinal hernia ?

A. In hydrocele, the swelling of the scrotum is uniform, transparent and fluctuating, begins below, and gradually ascends towards the abdominal ring ; the testicle cannot be felt ; the spermatic cord is free and not in the least enlarged. The tumour is not affected by the patient's coughing, and its size is not increased in the erect, nor diminished in the recumbent position of the body. Whereas in hernia, the swelling first presents itself at the inguinal ring, and proceeds downwards ; it is increased by coughing, its bulk is greatly affected by the various positions of the body, and it can be made entirely to disappear by pressure. The spermatic cord cannot be felt, while the testicle easily can ; and the stomach and bowels are generally disordered. In congenital inguinal hernia, although the testicle is not distinguishable to the touch, the contents of the tumour can be pushed up into the abdomen.

Q. How is encysted hydrocele of the spermatic cord distinguished ?

A. By the gradual increase of the tumour ; by its being incapable of reduction ; its fluctuation ; the equality of its surface, and by its size remaining unaltered in every position of the body.

Q. How is cirsocele to be distinguished from inguinal hernia ?

A. The patient should be placed in the horizontal position, and the tumour reduced by pressure ; he should then raise himself erect, and if the case be a hernia, the swelling cannot return, so long as the pressure is continued ; but if it be a cirsocele, it will not only re-appear while the ring is compressed, but its size will be greatly increased, owing to the course of the returning venous blood being obstructed.

Q. How is hæmatocele to be distinguished ?

A. By the irreducible state of the tumour, by its not being affected by coughing, by its firmness, by its being unconnected with the spermatic cord, and by the discolouration of the integuments.

Q. How is detention of the testicle to be distinguished?

A. By the sensibility of the tumour, and the absence of the gland in the scrotum.

Q. What are the diagnostic symptoms of bubo ?

A. The tumour is circumscribed, red, extremely hard and painful, and not connected with the abdominal ring or spermatic cord.

Q. By what indications can the surgeon distinguish lumbar abscess ?

A. By the fluctuation of the tumour, by its having no connexion with the spermatic cord, its being preceded by pain in the loins, and often accompanied with hectic symptoms.

Q. How is hernia humoralis to be distinguished ?

A. By the extremely painful state of the testicle, hardness of the epididymis, pain in the loins, redness of the scrotum, and by the disease being generally preceded by gonorrhœa.

Q. How is femoral, to be distinguished from inguinal hernia ?

A. In femoral hernia, Poupart's ligament is felt passing over the neck of the sac, and the spine of the pubis situated on the same level, and rather within it. In inguinal hernia, Poupart's ligament is below the neck of the sac, and the spine of the pubis behind and below it.

Q. Into how many kinds is inguinal hernia divided ?

A. Into two ; the external and internal.

External Inguinal Hernia.

Q. Along what passage, do the viscera descend, in external inguinal hernia ?

A. Along the abdominal or inguinal canal, following the same course as the spermatic cord in the male, and the round ligament in the female.

Q. Describe the course of the spermatic cord ?

A. The spermatic cord descends from the abdomen, obliquely downwards and forwards, along the inguinal canal into the scrotum. On first leaving the abdominal cavity, it passes through an opening in the fascia transversalis, called the internal or upper abdominal ring ; it then runs under the fleshy inferior borders of the transversalis and obliquus internus muscles, and after continuing its course a little further down towards the pubes, finally emerges at the inguinal ring.

Q. Of what parts does the spermatic cord consist ?

A. Of the vas deferens, spermatic artery, vein and nerves ; all of which are closely united together by cellular membrane, and inclosed in a sheath termed the tunica vaginalis, a production of the peritoneum.

Q. As it is necessary to understand the surgical anatomy of the groin, will you describe the different fasciæ and muscles as they appear in the order of dissection ?

A. As soon as the common integuments are divided and turned back, the fascia superficialis is brought into view. This fascia covers the sides of the abdomen, invests the penis, and sends a sheath to the spermatic cord ; it then passes over Poupart's ligament, and extends over the fascia lata of the thigh. Beneath, or on the dorsal aspect of the fascia superficialis, lies the tendon of the external oblique, the fibres of which, divide about an inch and a half from the symphysis pubis, and form the inguinal or lower abdominal ring, which transmits the spermatic cord in the male, and the round ligament of the uterus in the female. To the margin of this ring, is attached a thin membrane, termed fascia propria, which descends and covers the cremaster muscle. The tendon of the external oblique being separated from Poupart's ligament, and reflected upon itself, the obliquus internus, and part of the cremaster muscles will be seen. Behind and connected with the internal oblique, is the transversalis abdominis. If the sacral or inferior borders of the transversalis and obliquus internus be drawn upwards, the fascia transversalis will be exposed. This fascia, is situated between the transversalis muscle and peritoneum, and forms the internal or upper abdominal aperture.

Q. Describe more minutely the inguinal, lower or external abdominal ring ?

A. The inguinal ring, is an opening, formed by a division of the fibres of the external oblique muscle. It is not circular, as its name implies, but of a triangular figure, having its apex towards the ilium and its base towards the pubis. It has two sides or pillars, which are distinguished by the terms, upper or inner, and lower or outer. The former or atlanto-mesial one, is inserted into the symphysis pubis and into the os pubis of the opposite side; the other or sacro-lateral one, is united with Poupart's ligament, twisted inwards or dorsad, and fixed to the tuberosity of the pubis, and to part of the linea ilio-pectinea. These pillars are joined at their upper or iliac angle, by transverse tendinous fibres, which add considerably to their strength.

Q. Describe the internal or upper abdominal ring ?

A. The upper abdominal ring, is formed by the splitting of the fibres of the fascia transversalis. It is of the same size and form as the external one, and situated half way between the spine of the os ilium and symphysis pubis. The inferior margins of the obliquus internus and transversalis muscles, pass over its upper part; and Poupart's ligament, runs along its lower or sacral side.

Q. Describe the abdominal canal ?

A. The abdominal canal is about three inches in length, and extends between the internal and external abdominal apertures, running in the direction of Poupart's ligament. It is bounded sternad or anteriorly by the tendon of the external oblique, and dorsad or posteriorly by the fascia transversalis and part of the reflected tendons of the obliquus internus and transversalis muscles. It is filled by the spermatic cord, cellular substance and the cremaster muscle.

Q. What effect has hernia upon the upper abdominal ring?

A. It gradually forces it down from its natural situation, nearer the pubes. In large inguinal hernia of long standing, the upper or internal ring is brought so nearly opposite the external one, that the passage into the abdomen is almost direct.

Q. Describe the origin of the fascia transversalis?

A. This fascia arises from the inner or dorsal side of Poupart's ligament, from the iliac portion of the linea ilio-pectinea, and from part of the iliac fascia. It ascends for three or four inches between the transversalis muscle and peritoneum, and is divided into the iliac and pubal portions.

Q. What is the use of the fascia transversalis?

A. It prevents the bowels from protruding under the inferior edge of the transversalis and obliquus internus muscles, and also under Poupart's ligament, and it assists in the formation of the crural sheath. At the junction of its iliac and pubal portions, its fibres separate, to form the upper abdominal ring, which gives passage to the spermatic cord and round ligament.

Q. Describe the origin and course of the epigastric artery?

A. The epigastric arises from the inner side of the external iliac artery, and runs between the fascia transversalis and peritoneum, obliquely upwards and inwards towards the linea alba, to get behind the rectus muscle. In this course, it crosses over the external iliac vein, passes behind the spermatic cord and then on the mesial border of the upper abdominal ring. It is situated two inches from the tuberosity of the pubis, and has its accompanying vein on its mesial or inner side.

Q. How is it situated with regard to the hernial sac?

A. It runs first behind, and then on the mesial or inner side of the neck of the sac. By the long continued pressure of the protruded parts, it is often brought down from its natural situation, an inch or more nearer the pubes.

Q. Does the hernia descend on the fore or back part of the spermatic cord?

A. Occasionally it descends on the dorsal or posterior aspect, but generally on the sternal or anterior part of the spermatic cord, immediately beneath the cremaster muscle. In some instances, the distending force of the hernial tumour separates the spermatic vessels from each other.

Q. By what parts may the protruded viscera be strangulated in external inguinal hernia?

A. By the internal or external abdominal ring, or by the neck of the hernial sac.

Q. Do both the abdominal rings ever strangulate the displaced bowels at the same time?

A. Yes; this circumstance occasionally happens.

Q. What forms the stricture, when the parts are strangulated at the inner ring?

A. The inferior margins of the obliquus internus and transversalis muscles.

Q. What parts cover the hernial sac, in external inguinal hernia?

A. The skin, fascia superficialis, fascia propria and cremaster muscle. The coverings in the female are thinner, as there is no cremaster muscle.

Q. Does external inguinal hernia occur most frequently in men or women?

A. In the former. This arises from the abdominal canal and rings being more capacious and free in males than in females, and, from the former sex being more engaged in laborious occupations than the latter.

Q. At what periods of life does it most usually take place?

A. In infancy and old age.

Q. Explain why it is more common in infancy than middle age?

A. In infancy the abdominal rings are lax and situated very near to each other, and the abdominal canal is short and direct, consequently the viscera in this early period of life are more easily displaced at the inguinal ring, than in adult age; when the parts become stronger and the passage into the abdomen is more oblique.

Q. As the manner of reducing inguinal hernia by the taxis has been already considered, will you describe the operation of dividing the stricture?

A. The patient must be laid supine on a bed with his thigh bent on the pelvis; the operator then seating himself between the lower extremities of the patient, commences his first incision an inch above the external angle of the inguinal ring, and continues it over the middle of the tumour to its most depending part. As soon as he has cut through the integuments, he slits open the fascia superficialis, fascia propria and cremaster muscle, layer after layer. Having exposed the hernial sac, he raises up its anterior and inferior part with a pair of dissecting forceps, and making an opening into it, and introducing a director, divides it upwards to within an inch of the ring, and downwards, to the termination of the first incision. He then feels for the stricture, and passing his finger or a grooved director under it, divides it by means of a curved bistoury. The protruded parts are now to be freed from their adhesions, and if sound, returned into the abdomen. After the operation, the lips of the wound should be brought together, by sutures and adhesive plaster.

Q. What artery is divided by the first incision?

A. The external pudic, which is the first branch sent off from the femoral artery and distributed on the integuments of the groin and external parts of generation.

Q. By what marks is the hernial sac to be distinguished from the intestine?

A. The surface of the intestine is smooth and covered with numerous blood vessels; the sac is rough on its surface, and generally contains a small quantity of fluid.

Q. In what direction is the stricture to be divided, in external inguinal hernia?

A. Directly upwards, or upwards and outwards; whether it be situated at the external, or internal abdominal ring.

Q. Would it be dangerous to divide it upwards and inwards?

A. Yes; this proceeding would endanger the epigastric artery, which passes on the mesial or inner side of the neck of the sac.

Q. How should the protruded omentum be treated, if it has become enlarged, scirrhous, or mortified?

A. It should be cut away, and its bleeding vessels tied; if reduced, it would excite inflammation and produce death.

Q. How should the intestine be treated if mortified?

A. If the mortified part be small, the intestine should be reduced in the same manner as if it were in a sound and healthy state; but if the whole diameter of the bowel be mortified, the gangrenous part should be freely cut open, and the accumulated fecal matter discharged. In both cases, poultices and fomentations should be applied to the external wound, and clysters and purgative medicines administered. After some time, especially if the gangrene has been of small extent, the continuity of the intestinal canal is restored, and the artificial anus heals up.

Q. Should the stricture be divided in cases of mortified intestine?

A. The surgeon should certainly divide it, if there be not a free outlet for the fæces; otherwise, its division is not necessary.

Q. Is an artificial anus most dangerous when situated near, or at a distance from the stomach?

A. When situated near the stomach; because in this case the greater part of the chyle escapes through the opening instead of being absorbed, and the patient dies of inanition.

Q. What treatment does an artificial anus require?

A. It should be covered by a compress of linen, retained by means of a moderately tight bandage. If the intestine becomes prolapsed, which it sometimes does from coughing, or violent bodily exertion, in consequence of the artificial opening not being surrounded by a sphincter muscle, it should be returned into the abdomen, lest it suffer from strangulation.

Q. How is the patient to be treated after the operation for strangulated inguinal hernia?

A. His bowels should be emptied by mild clysters and aperient medicine, he should be allowed only the sparest diet, and if inflammation come on, it should be subdued by the ordinary means.

Q. How is the operation to be performed in cases of very large inguinal hernia?

A. Make an incision two or three inches in length, through the integuments, over the external abdominal ring, lay open the other investments of the hernial sac, pass a director under the tendon, and divide it upwards by a probe pointed bistoury, leaving the peritonæal sac untouched. In some cases however, the sac requires a small opening to be made into it near the ring, before the division of the tendon can be accomplished.

Q. What is meant by complete and incomplete external inguinal hernia?

A. External inguinal hernia is termed complete, when the protruded parts descend along the abdominal canal and come out at the inguinal ring; and incomplete, when they do not emerge at the external abdominal ring, but pass only through the internal one and remain lodged in the abdominal canal. The former or complete kind, we have just been considering; of the latter, we shall now say a few words.

Q. What parts cover the hernial sac in incomplete inguinal hernia?

A. The common integuments, the fascia superficialis, the tendon of the external oblique, and the cremaster muscle. The investments of the hernial sac are thinner in the female than the male, because in the former, the cremaster muscle is wanting.

Q. What forms the stricture in incomplete inguinal hernia?

A. The lower margins of the obliquus internus and transversalis muscles, which pass over the neck of the hernial sac.

Q. How is the hernial sac in incomplete inguinal hernia situated with regard to the spermatic cord and epigastric artery ?

A. The spermatic cord lies behind the sac ; the epigastric artery, runs first behind and then on the mesial or inner side of the neck of the sac.

Q. Describe the operation for incomplete inguinal hernia ?

A. Make an incision over the tumour parallel with the spermatic cord ; divide the fascia superficialis, tendon of the obliquus externus and the cremaster muscle successively ; then lay open the hernial sac, and last of all divide the inferior border of the internal oblique and transversalis muscles, either directly upwards or outwards towards the ilium.

Internal Inguinal Hernia.

Q. What other appellation has been given to internal inguinal hernia ?

A. It has been named ventro-inguinal hernia.

Q. Through what opening do the viscera protrude in ventro-inguinal hernia ?

A. They protrude through the inguinal ring, but they do not pass along the abdominal canal.

Q. In what direction do they protrude ?

A. They protrude first under the lower margins of the transversalis and obliquus internus muscles, and then through the inguinal ring, passing in a straight direction from behind forwards.

Q. How is the hernial sac situated with regard to the epigastric artery ?

A. The epigastric artery passes on the lateral or outer side of the mouth of the sac, and is three-fourths of an inch from it.

Q. On which side of the hernial sac is the spermatic cord situated ?

A. It is situated on the lateral or iliac side of the neck of the sac.

Q. How do you distinguish internal from external inguinal hernia ?

A. In the former species of the disease, the tumour is smaller, more globular, and appears situated nearer the symphysis pubis, than in the latter kind.

Q. What parts cover the hernial sac ?

A. The skin, fascia superficialis, and fascia propria.

Q. Is it not covered by the cremaster muscle ?

A. No.

Q. What part frequently forms the stricture in internal inguinal hernia ?

A. The lower edges of the transversalis and obliquus internus muscles, which pass over the neck of the hernial sac, immediately behind the external abdominal ring.

Q. In what direction should the stricture be divided ?

A. Directly upwards, or upwards and inwards.

Q. What important parts would be wounded, if it were divided upwards and outwards ?

A. The spermatic cord and epigastric artery.

Crural Hernia.

Q. Through what opening do the viscera protrude, in crural hernia ?

A. They protrude through the crural ring beneath Poupart's ligament, at the inner part of the bend of the thigh.

Q. Enumerate in order the different fasciæ and other parts connected with crural hernia as they appear on dissection ?

A. Immediately under the integuments of the thigh is the fascia superficialis; beneath the fascia superficialis is a layer of cellular substance, absorbent glands, the great saphena vein, and several cutaneous nerves. When all these parts are removed, the fascia lata comes into view, which is divided into two portions, the iliac and the pubal. The iliac is affixed to two-thirds of the outer part of Poupart's ligament, and spread over the muscles on the fibular side of the thigh; its tibial or inner edge is of a crescent form and termed the falciform process. The pubal portion arises from the inner third of Poupart's ligament, and covers the pectinalis and triceps; it is thinner, and appears on a lower level than the iliac portion, and forms an oval depression at the upper and inner part of the thigh; it has lying upon it, cellular membrane, a fewlymphatic glands, and part of the saphena major vein; it is bounded above by Poupart's ligament, and at its upper and outer margin by the falciform process.

Q. Describe the origin and insertion of Poupart's ligament?

A. Poupart's ligament arises from the superior anterior spinous process of the os ilium, and is inserted into the spine of the os pubis.

Q. What is Gimbernat's ligament?

A. Gimbernat's ligament is formed by that part of Poupart's ligament, which is doubled in and fixed to the spine of the os pubis. It presents a sharp, firm, semilunar edge towards the abdomen, and is broader in the male than the female.

Q. What forms the crural ring?

A. The crural ring is bounded on the mesial or inner side by Gimbernat's ligament; on its lateral or outer part by the external iliac vein; on its sternal or forepart by Poupart's ligament; and on its dorsal or posterior part by the os pubis.

Q. Is the crural ring open or closed?

A. It is closed; being filled up by cellular substance, lymphatic vessels, and sometimes an absorbent gland.

Q. What motions of the thigh relax the crural ring, and what render it tense?

A. The crural ring is relaxed by bending the thigh on the pelvis, rotating it inwards, and putting one leg across the other. It is made tense by extension, rotation outwards, and abduction of the thigh.

Q. What is the cribriform fascia?

A. The cellular membrane which fills up the crural ring is termed the cribriform fascia, in consequence of its sieve-like appearance, which it derives from the numerous perforations made in it by the lymphatic vessels, as they ascend from the thigh into the abdomen.

Q. What parts are situated under the crural arch ?

A. Next to the pubis are the lymphatic vessels of the thigh as they pass into the abdomen ; exterior to these, is situated the external iliac vein ; close to the lateral or outer side of which, is the external iliac artery; half an inch from the artery, is the anterior crural nerve, and on the outside and a little behind the nerve, are the psoas magnus and iliacus internus muscles.

Q. What is the relative situation of the hernial sac in crural hernia, with regard to the surrounding parts ?

A. The thin crescentic edge of Gimbernat's ligament is situated on the mesial or inner side of the neck of the sac ; the os pubis behind it ; the external iliac vein on its lateral or outer aspect ; and its upper and outer part is bounded by the superior extremity of the falciform process.

Q. What parts cover the hernial sac ?

A. The skin, fascia superficialis and cellular membrane.

Q. Is the hernial sac situated beneath the fascia lata ?

A. No ; it generally rests on the anterior surface of the pubal portion of the fascia lata.

Q. Is there no case, in which the hernial sac is covered by the fascia lata ?

A. Yes ; when the viscera descend within the femoral sheath.

Q. How is crural hernia situated with regard to the epigastric and obturator arteries ?

A. The epigastric artery passes on the iliac or outer side of the neck of the hernial sac, and is situated half an inch distant from it. The obturator artery, when it arises from the external iliac or root of the epigastric, runs behind the neck of the sac ; but when it is given off an inch from the origin of the epigastric, it passes over the fore and inner part of the hernial sac, and surrounds about three-fourths of its circumference.

Q. At what part of the tumour does the spermatic cord pass ?

A. It crosses over its atlantal or upper part, half an inch from the mouth of the hernial sac.

Q. Does the tumour of crural hernia descend far along the thigh ?

A. No ; as it increases in size, instead of passing down towards the knee, its fundus gradually rises up over the crural arch, and at length occupies nearly the same situation as inguinal hernia.

Q. What impedes the descent of crural hernia along the thigh ?

A. The very firm connexion of the fascia superficialis, with the inguinal lymphatic glands.

Q. Is the crural ring, the only part at which the viscera can descend under the crural arch ?

A. Yes ; their descent at any other point is prevented by the very intimate adhesion of the fascia iliaca, fascia superficialis and fascia lata, to Poupart's ligament.

Q. What forms the stricture in crural hernia ?

A. The protruded bowels in crural hernia, may be strangulated, either by Gimbernat's ligament, the falciform process of the fascia lata, or by the neck of the hernial sac.

Q. In which sex does crural hernia most frequently occur ?

A. In the female ; owing to the form of the pelvis, and narrowness of Gimbernat's ligament, rendering the crural ring wider in this, than in the opposite sex.

Q. What are the peculiar characters of crural hernia ?

A. It seldom attains a large size, and as it descends through a narrow opening, it is very liable to become strangulated ; it is extremely difficult of reduction, and always attended with great danger.

Q. What diseases may be mistaken for crural hernia ?

A. Inguinal hernia ; swelled lymphatic gland; psoas abscess ; varix of the femoral vein, and other tumours.

Q. As the manner of reducing crural hernia by the taxis has been already considered, will you describe the operation for dividing the stricture ?

A. The patient being placed as in inguinal hernia, an incision extending obliquely downwards and outwards, should be made over the centre of the hernial tumour; it should commence an inch above, and terminate a little below the base of the swelling. As soon as the integuments are cut through, the fascia superficialis and subjacent condensed cellular membrane are next to be cautiously divided. This exposes the hernial sac, which must be laid open in the manner already directed. The surgeon should now feel for the stricture, and after passing a grooved director under it, he should divide it by means of a probe pointed bistoury.

Q. In what direction should the stricture be divided?

A. Obliquely upwards and inwards, towards the pubes.

Q. What danger would ensue, if the stricture were divided upwards and outwards?

A. The epigastric artery would be wounded.

Q. Would it be dangerous to cut the stricture directly upwards?

A. Yes; by this proceeding the surgeon would divide the spermatic cord.

Q. What ligament does the operator divide when he cuts inwards?

A. Gimbernat's ligament.

Q. Will dividing Gimbernat's ligament relieve the strangulation, when this is produced by the falciform process?

A. Yes; because the one part is merely a continuation of the other.

Congenital Hernia.

Q. Explain in what manner congenital hernia is formed?

A. The testicles of the male fœtus during the early period of gestation, are situated in the abdomen, a little below the kidneys; about the seventh month, they descend along the inguinal canals into the scrotum, carrying before them a production of the peritonæum, which forms the tuniça vaginalis. The communication between the tunica vaginalis testis and abdomen, in general, soon becomes obliterated; sometimes however, it continues open after birth, in which case, the viscera escape from the latter, into the former cavity, and thus give rise to what is termed hernia congenita.

Q. What forms the sac in congenital hernia?

A. The protruded bowels in hernia congenita, are not enveloped in the peritonæum, and may be said to have no hernial sac; they are lodged in the cavity of the tunica vaginalis testis, and lie in close contact with the tunica albuginea.

Q. What remarks have you to offer with regard to the surgical anatomy of congenital hernia?

A. It is not different from that of external inguinal hernia.

Q. How is congenital to be distinguished from inguinal, or scrotal hernia?

A. By its occuring in very early life, and by its rendering the testis incapable of being felt.

Q. How is it to be treated?

A. In the reducible state, the protruded viscera must be returned into the abdomen, and retained by means of a truss. The surgeon, however, should be careful, not to apply this instrument, before the testicle has descended into the scrotum. The treatment of strangulated congenital hernia, is the same as that of strangulated bubonocele.

Q. What forms the stricture in congenital hernia?

A. The stricture most commonly exists in the neck of the hernial sac, sometimes however, the protruded parts are strangulated by contractions in the body of the sac, or by the abdominal rings.

Q. In what direction should the stricture be divided?

A. Either directly upwards, or upwards and outwards towards the os ilium.

Q. What is meant by hernia infantilis?

A. When the viscera, contained in a common peritoneal sac, descend into the cavity of the tunica vaginalis testis, the disease is named hernia infantilis.

Q. How is hernia infantilis to be treated ?

A. In the same manner as hernia congenita.

Q. Enumerate the parts which the surgeon has to divide in performing the operation for strangulated congenital hernia ?

A. The skin, fascia superficialis, fascia propria, cremaster muscle, and tunica vaginalis testis. In strangulated hernia infantilis, the operator must remember, after laying open the tunica vaginalis, to divide the peritoneal sac before reducing the displaced bowels.

Umbilical Hernia.

Q. Through what opening do the bowels protrude, in umbilical hernia ?

A. When the disease occurs in infants, they protrude directly through the opening which transmitted the umbilical vessels of the fœtus ; but when it takes place in adults, they protrude by the side of this opening.

Q. What viscus is generally contained in umbilical hernia ?

A. The omentum. Sometimes the tumour contains both omentum and intestine, and very rarely intestine alone.

Q. What intestine is most frequently protruded in umbilical hernia ?

A. The transverse arch of the colon. Occasionally the small intestines and cœcum are herniated at the umbilicus.

Q. What individuals are most liable to this disease ?

A. Children, pregnant females, and corpulent or ascitic people.

Q. Have the protruded parts in umbilical hernia, a peritonæal sac ?

A. Yes.

Q. What covers the hernial sac ?

A. The common integuments.

Q. How is umbilical hernia to be treated ?

A. In early life, it may be cured by compression, or ligature; both of which are more successful the sooner they are had recourse to. Compression generally proves effectual, if employed when the patient is very young, as its operation is at this time assisted by the natural tendency of the umbilicus to contract. Umbilical hernia of adult age, should be treated on the same principles as inguinal and crural hernia.

Q. What part forms the stricture in umbilical hernia?

A. The tendinous opening in the linea alba, or the neck of the hernial sac.

Q. In what direction should the stricture be divided?

A. Directly upwards.

Perinæal Hernia.

Q. What are the symptoms of perinæal hernia?

A. Perinæal hernia is indicated by the appearance of a swelling, on one side of the raphe of the perinæum, which possesses all the diagnostic characters of a hernial tumour.

Q. Between what viscera do the herniated parts descend?

A. In the male, between the bladder and rectum; in the female, between the vagina and rectum.

Q. What viscera are protruded in perinæal hernia?

A. Generally the small intestines; occasionally the bladder.

Q. What treatment does perinæal hernia require?

A. The parts should be reduced and supported by a compress and T bandage.

Vaginal Hernia.

Q. What are the symptoms of vaginal hernia?

A. In this disease, a tumour is formed within the os externum, which has all the characters of other herniæ. It generally contains the small intestines.

Q. How is it to be treated?

A. The protruded bowels should be reduced and retained by a pessary.

Pudendal Hernia.

Q. What are the symptoms of pudendal hernia ?

A. In pudendal hernia, the viscera descend between the vagina and ramus ischii, and form a tumour in the labium pudendi. This species of hernia is easily distinguished from bubonocele, but has sometimes been mistaken for ischiatic hernia.

Q. What is the proper treatment for pudendal hernia ?

A. It should be treated in the same manner as other hernias. Before the tumour is reduced, the bladder should always be emptied. If the displaced bowels become strangulated, an operation should be performed, and the stricture divided inwards towards the vagina.

Obturator Hernia.

Q. Through what opening do the viscera protrude in obturator hernia ?

A. Through the opening at the upper and anterior part of the obturator ligament, which gives passage to the obturator artery, vein and nerve. The fundus of the hernial sac is covered by the pectinalis, and by the first and second heads of the triceps adductor femoris. The obturator vessels are situated behind, and the os pubis before the neck of the sac.

Q. If an operation were required in obturator hernia, in what direction should the stricture be divided ?

A. Mesiad or inwards.

Ventral Hernia.

Q. What is understood by ventral hernia ?

A. When the viscera become protruded through artificial openings in the abdominal parietes, the affection is denominated ventral hernia.

Q. What are the causes of ventral hernia ?

A. Violent contusions, penetrating wounds, &c.

Q. At what part of the abdominal surface does i most commonly occur?

A. At the linea alba, between the recti muscles.

Q. How is ventral hernia to be treated?

A. Like other hernias. It is seldom strangulated.

Phrenic Hernia.

Q. What is meant by phrenic hernia?

A. Phrenic hernia is formed by some of the abdominal viscera protruding through the diaphragm int the chest.

Q. How is mesocolic hernia produced?

A. By the viscera insinuating themselves betwee the layers of the mesocolon.

Q. How is mesenteric hernia occasioned?

A. By the viscera passing through a lacerated opening, formed in one of the layers of the mesentery, in consequence of some violent concussion of the body.

Q. Can any practice be resorted to for the relief o phrenic, mesocolic, or mesenteric hernia?

A. No; for their existence is not known during life.

Cystocele, or Hernia of the Urinary Bladder.

Q. At what part is the urinary bladder most frequently herniated?

A. At the inguinal ring.

Q. Is it protruded at any other points?

A. Yes; at the vagina and perinæum.

Q. What are the symptoms of cystocele?

A. Cystocele produces retention of urine, accompanied with disorder of the intestinal canal. When the tumour is compressed, an inclination to expel the contents of the bladder immediately comes on. By retaining the urine, the tumour is enlarged; but it diminishes and becomes flaccid, on voiding it.

Q. How is cystocele to be treated?

A. The surgeon can do little else than support the tumour by means of a suspensory bandage. Strangulation seldom or never takes place. If calculi form in the bag of the herniated bladder, they should be cut out.

FISTULA IN ANO.

Q. What is understood by fistula in ano?

A. Fistula in ano, is a term applied to every collection of matter formed in the vicinity of the anus.

Q. What are the symptoms of true fistula in ano?

A. There is a discharge of thin sanies from the anus, or from a small fistulous opening in its immediate vicinity; the surrounding integuments are red and indurated, the patient complains of pain in evacuating the fæces, and is not unfrequently affected with strangury and other disagreeable affections.

Q. Into how many kinds is fistula in ano divided?

A. Into three; viz. the blind external; the blind internal; and the complete. The first obtains, when the abscess bursts externally; the second, when it opens into the rectum; and the third, when it has not only an external aperture, but also communicates with the intestine.

Q. How is fistula in ano to be treated?

A. If an abcess form near the anus, an early opening should be made into it, for the discharge of the matter. Gentle aperients must be administered, and if the inflammation be of the erysipelatous kind, great attention should be paid in correcting the morbid state of the constitution. When sinuses form, they must be laid open and healed from the bottom, the surgeon first ascertaining, by the introduction of a probe, their course and extent.

Q. How is the operation for blind external fistula to be performed?

A. The patient being properly placed, a cylindrical piece of horn smeared with oil, must be carefully placed in the rectum, to prevent the opposite side of the bowel from being cut. The surgeon then introduces a sharp pointed bistoury into the fistulous opening, and after conveying it to the very bottom of the sinus, pushes its point through the coats of the rectum; he now draws the instrument towards himself, and divides the side of the intestine and sphincter ani. A dossil of lint should be inserted into the wound, an emollient poultice applied, the patient confined to bed, and gentle aperients administered.

Q. In what position should the patient be placed?

A. If the fistula be on the right side of the anus, he should lean forwards over a table; if it be situated on the left side, he should be placed in the same posture as in the operation of lithotomy?

Q. Is it always adviseable to divide the sphincter ani?

A. Yes; because the action of this muscle, if left uncut, by tearing asunder the sides of the fistula, greatly impedes the cicatrization of the parts.

Q. Describe the operation for complete fistula in ano?

A. The patient being placed in the position already mentioned, the surgeon introduces his left fore finger into the rectum; he then passes a probe pointed bistoury from the external, up to the internal fistulous orifice, and drawing the instrument towards himself, cuts through the side of the rectum, and divides the sphincter ani.

Q. Describe the operation for blind internal fistula?

A. The patient being properly placed, a small opening must be made with a lancet close to the anus. Into this opening a sharp pointed bistoury should be introduced, and then pushed along the peripheral, or outer surface of the rectum, up to the internal fistulous orifice, and the operation finished as in complete fistula.

STRICTURE OF THE RECTUM.

Q. Into how many kinds, is stricture of the rectum divided?

A. Into two; the spasmodic and permanent.

Q. What are the symptoms of spasmodic stricture?

A. The patient is affected with costiveness and pain about the anus, especially after having a motion; the fæces are flattened, small in diameter, and have a twisted appearance. When the finger is introduced into the rectum, the lower sphincter is felt spasmodically contracted.

Q. Is the intestine sound in spasmodic stricture?

A. Yes.

Q. What is the cause of spasmodic stricture?

A. Constipation, piles, drastic purges, &c.

Q. How is it to be treated?

A. The disease generally disappears under the use of gentle aperients conjoined with abstemious regimen.

Q. What are the symptoms of permanent stricture of the rectum?

A. In this complaint, the fæces are flattened and diminished in volume, and the patient experiences great difficulty in expelling them; the pain about the anus is very severe, and does not remit, as in spasmodic stricture. When the finger is passed into the rectum, the bowel is felt contracted two or three inches above its inferior extremity. If the disease be not checked, abscesses form in the vicinity of the anus; the internal membrane of the intestine ulcerates, and the patient dies.

Q. What treatment does permanent stricture of the rectum require?

A. The frequent introduction of bougies; the division of the callous contracted part of the intestine; the removal of the numerous tubercles with which its inner surface is generally studded; or cutting through the fibres of the sphincter ani, forms the curative process. If the disease be connected with syphilis, mercury should be administered.

DISEASES OF THE PENIS.

Q. Enumerate the diseases of the penis?

A. Màlformation, inflammation, lues venerea, phimosis, paraphimosis, and cancer.

Lues Venerea.

Q. How are the symptoms of lues venerea divided?

A. Into local and constitutional.

Q. What appellations have been given to the local symptoms?

A. Chancre and bubo.

Q. Describe the symptoms and progress of chancre?

A. Chancre generally appears about six days after coition, and commences in the form of a small transparent pustule, which in the course of a short time bursts, and after discharging its contents, degenerates into a deep spreading ulcer of a circular form, the edges of which are hard and thickened, and surrounded by a pale coloured inflammation. When chancre occurs on less tender and sensible surfaces than the glans penis, as the scrotum, perinæum, or outer aspect of the prepuce, the ulceration is not preceded by a vesicle, but by redness and excoriation of the part.

Q. What are the symptoms of venereal bubo?

A. Venereal bubo, which consists in an inflammatory affection of one of the inguinal lymphatic glands, and arises from the irritation, or absorption of venereal virus, commences with a feeling of uneasiness in the groin, especially during walking. This is succeeded by preternatural redness of the integuments, and the formation of a small, hard, painful tumour, which at first is about the size of a large bean, but speedily acquires that of a pullet's egg. If not discussed, it proceeds rapidly to suppuration. Sometimes, however, the tumour does not burst, but as it continues to get larger, becomes extremely indurated and insensible.

Q. In what parts do the constitutional symptoms of lues venerea appear?

A. They first present themselves in the mucus membrane of the fauces, mouth and nose; the eye is the part next affected, then the skin, and lastly the bones. When constitutional lues attacks the fauces and mouth, it produces in these parts, deep white looking ulcers, having hard, elevated, and irregular edges, and encircled by a dark coloured erythematous inflammation. When it attacks the eye, this organ becomes inflamed and ulcerated; and when the skin is contaminated, copper coloured spots covered with thick scales, appear on various parts of its surface, but especially on the breast, shoulders, and abdomen. These spots terminate in foul ulcers, from which an acrimonious and fetid matter is discharged. When the disease settles in the bones, it renders them exceedingly painful, particularly at nights; they inflame, become affected with exostoses, and eventually grow carious.

Q. Which bones are usually affected with lues?

A. Those of the cranium, the inferior maxillary bone, the clavicle, sternum, distal extremity of the radius and the tibia.

Q. What is the best mode of treating chancre?

A. When recent and not inflamed, its surface must be washed with astringent lotions, or destroyed by lunar caustic; and a mild mercurial course, conjoined with aperients, cleanliness, rest and low diet, resorted to. If the sore becomes indolent, a lotion containing oxymur. hydrarg. or sulphas cupri, will accelerate its cicatrization. When chancre is inflamed, all mercurial preparations and the application of caustic become inadmissible, while warm anodyne fomentations, horizontal posture, purgative medicines, and spare diet, are the only means to be employed. Sometimes the ulcer grows irritable, and instead of contracting, spreads wider and wider, during the administration of mercury. Under these circumstances, the mercury should be intermitted, and the case treated entirely on antiphlogistic principles.

Q. How is venereal bubo to be treated?

A. In the early stage, and when the tumour is small, it should be discussed by topical bleeding, the application of saturnine lotions to the groin, purgative medicines, confinement to bed, and low diet. When the swelling is large and much inflamed, general blood-letting will sometimes be adviseable, and if it threaten to suppurate, recourse should be had to warm fomentations and poultices; if the abscess does not burst spontaneously, it should be opened either by a lancet or by means of caustic. In the treatment of bubo, a mild mercurial course, consisting of frictions with the ung: hydrarg: and the exhibition of pilul. hyd. should be conjoined with the above antiphlogistic measures. When a bubo is in an indurated and indolent condition, the frequent application of blisters to the groin, causes the tumour either to subside or suppurate.

Q. How is constitutional lues to be treated?

A. Recourse should first be had to frictions, with mercurial ointment; to mercurial fumigations, and to the exhibition of the milder mercurial preparations, so that the system may be speedily, though moderately affected by the action of that metal. The administration of sarsaparilla, guiacum, and nitric acid, along with the employment of mercury, will frequently expedite the cure. The nocturnal pains are best relieved by opium; the foul ulcerations in the throat should be checked by the application of solutions of oxymur: hydrarg: and the swellings of the bones, periosteum and tendons, are most effectually dispersed by the repeated use of blisters.

Phimosis.

Q. What is understood by phimosis?

A. When the prepuce is so contracted at its extremity, that it cannot be drawn back so as to expose the glans penis, the disease is denominated phimosis.

Q. What is the cause of phimosis?

A. It is most commonly produced by inflammation of the prepuce. Sometimes it is a congenital affection.

Q. How is phimosis arising from inflammation to be cured?

A. The inflammation, from which the complaint originates, should first be subdued. As soon as this is effected, the surgeon should stretch the prepuce forwards, and then, by means of a phimosis knife introduced between it and the glans penis, divide it by a longitudinal incision.

Q. On which side of the prepuce should this incision be made?

A. Either on the dextral, sinistral, atlantal, or sacral side. The latter situation is to be preferred.

Q. How is congenital phimosis to be treated?

A. It is best relieved by the operation of circumcision, which consists, in taking hold of the extremity of the prepuce with a pair of forceps, and cutting as much of it away with a small bistoury, as is deemed proper; the bleeding vessels are to be tied, and the two layers of the prepuce kept in accurate opposition by sutures applied near their edge.

Paraphimosis.

Q. What is meant by paraphimosis?

A. When the prepuce has been drawn behind the corona glandis, and will not admit of again being brought forwards, the complaint is termed paraphimosis. In boys it is seldom attended with serious consequences, but when it occurs in adults, the skin of the prepuce often becomes violently inflamed and ulcerated, and the glans penis destroyed by mortification.

Q. In what manner is paraphimosis to be reduced?

A. In recent cases, the reduction may be accomplished by first immersing the penis in cold water, and then compressing the glans, and at the same time, drawing the prepuce forward. In the more advanced stage of the complaint, when the prepuce is considerably swollen, the application of leeches and warm fomentations is necessary, in order to relieve the inflammation, before the parts can be handled. When all attempts at reduction prove ineffectual, the stricture should be divided by a scalpel and director.

Cancer of the Penis.

Q. Describe the symptoms and progress of cancer of the penis?

A. This disease usually commences in the form of a small wart-like excrescence, which appears on the prepuce or glans penis. It has a broad base, grows with great rapidity, and is attended with considerable pain. After a longer, or shorter period, it ulcerates and discharges a thin offensive fluid. The edges of the ulcer are hard and irregular, and the parts immediately surrounding it, of a deep purple hue. If the disease be not extirpated, the ulceration spreads wider and wider; the inguinal glands become contaminated, they swell and grow painful; fistulous openings form along the course of the urethra, and the patient at last sinks under the excessive irritation.

Q. How is this disease to be cured?

A. The only mode of removing it is by amputation of the penis.

Amputation of the Penis.

Q. Describe the operation of amputation of the penis?

A. The patient being seated on the edge of a chair, the operator lays hold of the penis with his left hand, and drawing it towards himself, so as to stretch the skin, divides it with one stroke of the scalpel; he then ties the arteries, brings the prepuce over the end of the stump, and introduces a flexible gum catheter along the urethra into the bladder. If there be much hæmorrhage from the wound, lint must be applied to it, and a moderately tight bandage put round the penis. When the penis is to be amputated very near the pubes, it must not be cut through at one stroke, but by several successive incisions, the surgeon taking care to secure each artery, as soon as divided. Before the operation is begun, the skin should be well drawn forwards and fixed with a tape.

Q. What arteries are divided in this operation?

A. The two dorsal arteries of the penis, the arteries of the corpora cavernosa, and the two arteries of the corpus spongiosum urethræ.

DISEASES OF THE URETHRA.

Q. What are the diseases of the urethra?

A. Inflammation, gonorrhœa, stricture, abscess, fistula, false passage, calculi lodging in it.

Gonorrhœa.

Q. How many kinds of gonorrhœa are there?

A. Three, viz. gonorrhœa simplex, gonorrhœa virulenta, and gonorrhœa chronica.

Q. What are the symptoms of gonorrhœa simplex?

A. In this complaint, which is nothing more than a slight inflammatory affection of the urethra, the secretion of the mucous glands of the canal is preternaturally increased; the discharge, for the most part, is thick, white, and without acrimony; it is not contagious, but sometimes becomes thin, yellowish coloured, and attended with considerable uneasiness, or even pain in voiding urine.

Q. By what causes is it commonly produced?

A. By the application of irritating substances to the urethra, such as acrimonious injections, bougies, &c. Sometimes it arises from excess in venery, cold, the improper use ef cantharides, frequent purging, violent horse exercise, or the irritation of teething.

Q. What treatment does gonorrhœa simplex require?

A. It generally soon disappears under the use of warm fomentations, poultices, and demulcent injections, conjoined with mild cathartics, diluents, low diet and rest.

Q. Describe the symptoms and progress of gonorrhœa virulenta?

A. The patient at first complains of a slight itching on the glans penis, accompanied with a tingling sensation and tenderness along the course of the urethra. In a short time, some uneasiness is experienced on making water, and a whitish purulent matter appears at the urethral orifice, the edges of which look red and thickened; in two or three days, the quantity of the discharge is increased, and as the inflammation advances, becomes thinner, more acrimonious, and of a yellow or greenish colour; a severe scalding pain is now felt on passing the urine, which is sometimes mixed with blood, and generally flows in a small broken stream, owing to the caliber of the canal being contracted. The glans is extremely red, and the whole penis tense, swollen and knotty; involuntary erections, attended with excruciating pain and chordee take place, particularly at nights, and the patient is affected with head-ache, restlessness, and other symptoms of fever. If the disease be not checked, the inflammation spreads to the prepuce, lymphatic glands of the groin, testis, prostate gland, or neck of the bladder, giving rise to phimosis, bubo, hernia humoralis, tenesmus, constant micturition, or total suppression of urine.

Q. How is gonorrhœa virulenta produced?

A. By the immediate contact of a specific virus, contained in the discharge from the urethra or vagina of an infected person.

Q. Does the discharge proceed from an ulcer in the urethra?

A. No. It is secreted from the internal membrane of this canal, and from its lacunæ, both of which are in a state of inflammation.

Q. How is gonorrhœa virulenta to be treated?

A. To subdue the inflammatory action of the first stage, recourse should be had to saline purgatives, bleeding, and other antiphlogistic measures; and to relieve the ardor urinæ, chordee and nocturnal erections, the surgeon should prescribe warm fomentations, and anodyne injections in conjunction with opium, camphor and hyosciamus. In the second or chronic stage, the cold hip bath, tonic medicines, cubebs, balsam of capaiba, tincture of cantharides, &c. are the most effectual remedies.

Stricture of the Urethra.

Q. What are the symptoms of stricture of the urethra?

A. The first symptom is a frequent inclination to make water, accompanied with a gleety discharge from the urethra. As the obstruction increases, nocturnal emissions of semen take place, the urine is not passed without pain and effort, and the stream is scattered and diminished in size. In the advanced stage of the disease, the urine comes away by drops, and is sometimes mixed with purulent matter or glairy mucus; the patient is distressed with severe pain in the loins, and often attacked with violent paroxyms of fever. Exposure to cold, exercise, excess in venery, and the pleasures of the table, aggravate all the symptoms of stricture, and cause complete obstruction of urine.

Q. How are strictures divided?

A. Into permanent, spasmodic and mixed.

Q. At what parts of the urethra does stricture most frequently occur?

A. The most frequent seat is just behind the bulb. Stricture also often takes place close to the external orifice of the urethra, or four inches and a half within the canal.

Q. What are the evils resulting from stricture of the urethra ?

A. Inflammation and thickening of the bladder, retention of urine, and dilatation and ulceration of the urethra. When the urethra ulcerates, the urine escapes into the cellular membrane, and produces inflammation, gangrene, urinary abscess and fistula.

Q. How is stricture of the urethra to be treated ?

A. Its situation and extent must first be ascertained. If the contracted part be found to be extensive, it should be removed by dilatation. For this purpose, metallic or common bougies should be employed ; they should always be introduced in the morning, and allowed to remain in the passage as long as the patient can bear, and their size should be gradually increased. If the stricture be very narrow, or form merely a ring in the urethra, or if it be of the irritable or spasmodic kind, it should be destroyed by the caustic bougie, which ought to be applied every morning or every second morning.

Q. When the stricture occupies a large portion of the urethra, and is so complete, as entirely to prevent the introduction of the bougie, what should be done ?

A. In this case, the symptoms should be relieved either by opening the urethra behind the stricture, or by puncturing the bladder through the rectum. The stricture should next be destroyed, and as soon as this is accomplished, the artificial passage heals up and the urine again flows along its natural channel.

Urinary Abscess and Fistula.

Q. What is the cause of urinary abscess and fistula ?

A. When stricture has advanced so far as to render the urethra completely impervious, the passage becomes ulcerated immediately behind the seat of obstruction, and the urine is forced into the cellular membrane. The injected parts swell and inflame, suppuration speedily takes place, and a fistulous opening is produced.

Q. How is urinary abscess to be treated ?

A. As soon as the extravasation of urine has occurred, the surgeon should introduce a catheter into the bladder, and this he easily accomplishes, if the ulceration has destroyed the stricture, which not unfrequently happens ; he should then make an incision into the swelling, reduce the inflammation by bleeding and warm fomentations, and not withdraw the catheter until the parts are healed. If the introduction of the catheter be impracticable, the surgeon should in this case, after opening the swelling and subduing the inflammation, destroy the stricture by the caustic or common bougie. When the the stricture is removed, the fistula, generally closes. Where the bougie proves ineffectual, a staff must be passed down the urethra as far as the stricture, the passage laid open, a catheter conveyed into the bladder, and retained until cicatrization be completed.

DISEASES OF THE SCROTUM.

Q. What are tho diseases of the scrotum ?

A. Anasarcous swelling or hydrocele œdematodes, varicocele, hæmatocele, sarcomatous enlargement and cancer.

Anasarca of the Scrotum.

Q. What are tho symptoms of anasarcous swelling of the scrotum ?

A. Anasarca of the scrotum, presents a soft inelastic tumour, which when pressed upon by the finger, retains the mark for some time. The skin is not inflamed. When the disease is slight, the scrotum preserves its natural rugosity ; when severe, it becomes smooth and tense. Sometimes the serous fluid passes from the cellular membrane of the scrotum, into that of the prepuce, in which case, the penis appears twisted and deformed.

Q. How is this disease to be remedied ?

A. When it is a symptom of anasarca or ascites, it can only be removed when the original complaint is cured ; but when it is purely local, it generally soon disappears under the use of cold lotions and purgative medicines. If the skin of the scrotum be much distended, the accumulated serum should be discharged by several punctures made with the point of a lancet. Large incisions ought to be avoided, as they are dangerous, and not unfrequently produce mortification.

Varicocele.

Q. What is varicocele ?

A. A morbid and permanent enlargement of the veins of the scrotum. It is produced by violent exercise, or the long continued pressure of a truss. The treatment consists in suspending the scrotum by means of a proper bandage.

Hæmatocele.

Q. What is hæmatocele ?

A. A swelling of the scrotum or spermatic cord, produced by an accumulation of extravasated blood.

Q. How many kinds of hæmatocele are there ?

A. Five ; one is situated in the cellular membrane of the scrotum, one in the membrane surrounding the spermatic vessels, one within the tunica albuginea, and two in the tunica vaginalis testis.

Q. What is the cause of hæmatocele ?

A. The first kind is produced by blows or other injuries inflicted on the scrotum, whereby the vessels are ruptured and the blood effused into the cellular membrane ; the second arises from rupture of one of the spermatic veins ; the third is connected with disease of the testicle ; the two last are occasioned by a vessel of the vaginal coat either being wounded during the operation for hydrocele, or spontaneously bursting after the operation has been performed. In both cases, the blood is contained in the tunica vaginalis.

Q. What treatment is necessary for the dispersion of hæmatocele?

A. Hæmatocele of the cellular substance of the scrotum, is for the most part readily dispersed by cold lotions, camphorated embrocations, leeches, suspensory bandage and saline purgatives. If discutient means prove ineffectual, a free incision should be made into the swelling. Hæmatocele of the spermatic cord is generally reduced by cold applications, stimulating liniments, gentle compression, bleeding, purgatives and confinement to bed. If these means fail to produce absorption of the effused blood, the tumour should be cut open, and the bleeding point plugged with a dossil of lint, or the vessel tied. Hæmatocele of the tunica albuginea requires extirpation of the testicle. Hæmatocele of the tunica vaginalis, when existing only in a slight degree, may be removed by discutient lotions and saline cathartics. When the complaint is very considerable, an opening should be made into the tunica vaginalis, the extravasated blood discharged, and dry lint applied to the central or inner surface of the membrane.

Sarcoma of the Scrotum.

Q. What appearances does sarcomatous enlargement of the scrotum present?

A. When the scrotum is affected with sarcoma, it grows to a most enormous bulk. The tumour is never painful, and only creates inconvenience by its size and weight. Its surface is generally smooth, though sometimes covered with yellowish scales and small herpetic ulcers. The testicles and spermatic cord are generally in a perfectly healthy condition.

Q. How should it be removed?

A. The diseased mass should be cut away, care being taken during the operation, not to wound the testicles, spermatic cord, corpora cavernosa, penis or urethra. When the tumour is removed, the skin should be applied over the testicles, and the lips of the wound secured by plaster and bandage.

Cancer of the Scrotum.

Q. Describe the symptoms and progress of cancer scroti or chimney-sweeper's cancer?

A. The lower surface of the scrotum, is the part, where this disease makes its first appearance. It produces a painful ulcer with hard elevated edges, and after making its way through the scrotum, affects the body of the testicle; it then spreads along the spermatic cord, and contaminates the inguinal glands; at last, it is communicated to the abdominal viscera, and ultimately destroys life.

Q. What is the cause of cancer scroti?

A. The disease is occasioned by soot lodging in the rugæ of the scrotum, and by its acrimony irritating the part.

Q. How is this disease to be cured?

A. Immediate extirpation of the ulcerated part affords the only means of cure. If the operation be delayed until the system or even the testicle become tainted, it is quite unavailing, the disease speedily returns, and the patient perishes.

DISEASES OF THE SPERMATIC CORD.

Q. With what diseases is the spermatic cord affected?

A. Diffused or encysted hydrocele and cirsocele.

Diffused Hydrocele of the Spermatic Cord.

Q. Give a description of diffused hydrocele of the spermatic cord?

A. Diffused hydrocele of the spermatic cord is a collection of watery fluid in the cellular membrane surrounding the spermatic vessels. The swelling is of a pyramidal figure and unattended with pain. By the application of pressure, it appears to diminish, but speedily acquires, either in the supine or erect posture, its usual size, as soon as the pressure is removed. The testicle is felt below the swelling, and the scrotum hangs lower on the diseased, than on the opposite side. The patient complains of uneasiness in the loins, and when the tumour becomes very large, it occasions great inconvenience. This disease is liable to be mistaken for cirsocele or omental hernia.

Q. How is it to be treated ?

A. When the tumour is small, the patient should have recourse to a suspensory bandage ; but when it has attained a large size, it must be laid open by an incision, extending from the abdominal ring to the testis.

Encysted Hydrocele of the Spermatic Cord.

Q. Describe the symptoms of encysted hydrocele of the spermatic cord ?

A. In this complaint, the fluid is contained in one particular cyst. The tumour is of an oblong form, and situated between the testis and abdominal ring. It never occasions any pain, is generally very tense, and possesses considerable transparency. It receives no impulse from coughing, and its size is not altered by change of position.

Q. At what period of life does this disease most frequently occur ?

A. At the early period of life.

Q. What diseases may be mistaken for it ?

A. Hydrocele of the tunica vaginalis testis, and hernia.

Q. How can you distinguish it from the former ?

A. In hydrocele of the tunica vaginalis, the swelling is first perceived at the lowest part of the scrotum, and when small, has the testicle lying above it ; after it has attained a large size, the gland is felt hard at its middle and posterior part. In encysted hydrocele of the spermatic cord, the swelling is always above the testicle, feels like a distended bladder, and has no hardness in any part of it.

Q. How is it to be distingished from hernia?

A. By its very gradual appearance and increase; by its size and form remaining unaltered in every position of the body; by its incapability of being returned into the abdomen; its receiving no impulse from coughing, nor becoming enlarged by holding the breath; and by its being attended with no derangement of the intestinal canal.

Q. In what manner ought it to be treated?

A. In children, the disease usually disappears under the use of aperient medicines and warm fomentations. If it resist these means, the swelling must be punctured, and its contents discharged. If the tumour be large and of long standing, the cyst should be exposed by carefully dividing the integuments; its anterior part should then be cut away, the lips of the wound closed by a suture, and inflammation subdued by emollient poultices.

Cirsocele.

Q. What is cirsocele?

A. A varicose enlargement of the spermatic veins.

Q. Describe its symptoms and progress?

A. Cirsocele generally commences close to the testicle, and for the most part appears very gradually. The swelling, which extends upwards as far as the abdominal ring, is knotty and unequal, tender to the touch, and creates a sensation of weight in the scrotum, and usually a feeling of numbness in the thigh; it is increased by exercise, long standing or violent exertion. In the advanced stage, cirsocele is attended with severe pain, that stretches to the back and loins; and when large, it presses upon, and wastes away the testicle.

Q. On which side does cirsocele most frequently occur?

A. On the left side. This circumstance may be attributed to the circulation of the left spermatic vein being interrupted by the pulsations of the aorta, which passes behind the left renal vein, in which the spermatic terminates; and also, by the pressure of hardened fæces accumulating in the sigmoid flexure of the colon.

Q. What are the causes of cirsocele?

A. Tumours pressing upon the vena cava inferior; the pad of a hernial truss violently compressing the spermatic cord; blows upon the groin; excess in venery, &c.

Q. How is cirsocele to be treated?

A. In recent cases, the patient should be recommended to wear a suspensory bandage, and frequently to wash the tumour with cold astringent lotions. If the disease create much pain, he should be confined to the horizontal posture, apply leeches to the groin, and take aperient medicine. If the symptoms do not yield to this treatment, recourse should be had, either to castration or removal of the diseased veins.

Q. Describe the operation of removing the varicose spermatic veins?

A. The patient being seated on a chair, the surgeon takes hold of the tumour with his left hand, and after dividing the integuments by an incision, extending from the abdominal ring to the bottom of the scrotum, he opens the tunica vaginalis, and exposes the spermatic veins. He then separates the diseased vessels from the other parts of the cord, passes two ligatures round them, one above and the other below, and cuts them completely away with a pair of blunt pointed scissors. As soon as the enlarged veins are removed, the testicle which dropt from the scrotum should be replaced, the lips of the wound united by the interrupted suture, the patient placed in bed, and inflammation subdued by antiphlogistic measures.

DISEASES OF THE TESTICLE.

Q. What are the principal diseases of the testicle ?

A. Inflammation, abscess, superficial or benign fungus, scrofulous enlargement, sarcocele, scirrhus, cancer, and fungus hæmatodes.

Q. What is inflammation of the testicle generally termed ?

A. Hernia humoralis.

Q. Describe the symptoms of hernia humoralis ?

A. In the beginning of the disease, the testicle is swollen, soft and tender to the touch ; after a short time it becomes hard and extremely painful. The spermatic cord is also very tender, and its veins are occasionally varicose. The patient is affected with depression of spirits, pain in the loins, sickness, violent fever, and sometimes difficulty of making water.

Q. What are the causes of hernia humoralis ?

A. External injuries, and irritation of the urethra ?

Q. How is the disease to be treated ?

A. The treatment consists in the repeated abstraction of blood from the inflamed parts by means of leeches ; in the exhibition of emetics and purgatives ; the use of warm fomentations and emollient poultices ; confinement to the horizontal posture and spare diet. If the fever run high, the pain in the loins be severe, and the patient young and vigorous, blood may be taken from the arm. If the disease terminate in suppuration, an early opening should be made for the discharge of the purulent matter. The hardness which generally remains in the epididymis, after the inflammation is removed, may be dispersed by frictions with camphorated embrocations.

Lipoma or Benign Fungus of the Testicle.

Q. What are the characters of this affection ?

A. Lipoma of the testicle presents an indolent excrescence of a red colour, arising through an ulcerated opening in the scrotum, from the glandular substance of the testicle, or from the surface of the tunica albuginea.

Q. What are causes of this disease?

A. It is generally produced by somo external injury of the testicle.

Q. How is it to be treated?

A. It should be removed by excision, ligature or caustic.

Scrofulous Enlargement of the Testicle.

Q. What are the distinctive characters of scrofulous enlargement of the testicle?

A. When the testicle is affected with scrofula, it swells and becomes soft, but seldom or never occasions any pain. If it suppurate, which is not unfrequently the case, it discharges a thin serum mixed with curd-like matter.

Q. What individuals are most subject to this disease?

A. Children and those of scrofulous constitutions.

Q. What treatment does it require?

A. In the first stage, endeavours should be made to effect the resolution of the swelling by gentle friction, sea-weed poultices, the use of a suspensory bandage, and by the exhibition of mild aperient in conjunction with tonic and alterative medicine. If the gland become painful and threaten to suppurate, recourse should be had to warm fomentations and poultices, and an early opening made into the abscess.

Sarcocele.

Q. What are the symptoms of sarcocele?

A. In sarcocele, the testicle becomes enlarged, indurated and extremely heavy. It creates little or no pain, but produces considerable uneasiness by dragging down the spermatic cord. The tumour at first is smooth, oval and flattened at its sides, but as it increases in bulk, irregularities arise on its surface, and it loses the natural form of the testis. When it acquires a malignant character, it ulcerates, fungi spring up from the ulcerated part, the abdominal viscera and general system become affected, severe constitutional irritation comes on, and the life of the patient is sooner or later destroyed.

Q. How is sarcocele to be cured?

A. Some kinds are cured by emetics, mercurial frictions, cold lotions, leeches, suspensory bandage, &c. In general however, the disease can only be removed by castration.

Scirrhus and Cancer of the Testicle.

Q. What are the symptoms of scirrhus of the testicle?

A. When the testicle becomes scirrhous, its substance acquires great hardness, its surface is knotty and irregular, its size, is generally increased, and its function destroyed. Scirrhus of the testicle is usually the result of inflammation or external injury, and is never accompanied with much pain.

Q. What symptoms indicate that the testicle is cancerous?

A. When pain attacks the testicle already affected with the symptoms of scirrhus, it is then regarded as cancerous. The pain shoots violently from the testis along the spermatic cord, which appears enlarged and knotty. The skin of the scrotum is of a livid colour, and its veins are varicose. When the tumour ulcerates, it discharges an offensive sanies; the inguinal glands and abdominal viscera at last become tainted, and the patient soon dies.

Q. How are scirrhus and cancer of the testicle to be remedied?

A. Neither disease can be removed, except by extirpation of the testicle.

Fungus Hæmatodes of the Testicle.

Q. Describe the symptoms of fungus hæmatodes of the testicle?

A. Fungus hæmatodes produces enlargement of the testicle. The tumour has a smooth, soft, elastic, and somewhat fluctuating feel; it is attended with no pain, but occasions, by its weight, considerable uneasiness in the loins. If the disease be not extirpated in its early stage, it soon involves the spermatic cord, inguinal glands and other parts, and seldom fails to destroy the life of the patient.

Castration.

Q. Describe the operation of castration?

A. The patient must be seated in a chair, with his head and shoulders reclining backwards. The surgeon then grasps the tumour in his left hand, and divides the integuments by an incision, extending from the abdominal ring to the bottom of the scrotum. As soon as he has exposed the spermatic cord, he detaches it from its surrounding connexions; he then separates the blood-vessels from the vas deferens, and includes them in a ligature, a little below which, he cuts through the whole cord. This part of the operation being finished, the testis should then be dissected out from the scrotum, and the artery of the vas deferens and the spermatic artery tied. The first ligature is now to be removed, and the lips of the wound brought together by sutures and adhesive plaster.

Q. What vessel besides the spermatic artery and artery of the vas deferens, sometimes requires to be tied in this operation?

A. The artery of the scrotum, which occasionally bleeds very profusely.

Q. If the skin of the scrotum be in a morbid condition, how should the surgeon proceed?

A. The diseased portion should be included in two elliptical incisions, and removed along with the testicle.

HYDROCELE.

Q. What is understood by hydrocele ?

A. A preternatural accumulation of serous fluid in the cavity of the tunica vaginalis testis.

Q. What are the characters of hydrocele ?

A. Hydrocele presents a pyriform elastic swelling of the scrotum, which first appears at the inferior extremity of the testicle, and gradually ascends towards the abdominal ring. The disease is attended with no pain, and generally takes place very slowly ; sometimes, however, its accession is sudden. It seldom occurs on both sides at once, but more frequently on the left than the right. It is more common in warm than in cold climates, and in some countries seems to be endemic. The tumour is generally hard at its posterior part, where the testicle is situated, and in its early stage is transparent and fluctuating.

Q. Does the testicle always lie on the dorsal or posterior aspect of the tumour ?

A. For the most part it does ; occasionally, however, it is situated on its sternal or anterior aspect. In hydroceles of long standing, the spermatic vessels are sometimes separated from each other, and spread over the fore part of the lower extremity of the tumour.

Q. Does the fluid entirely surround the testicle ?

A. No ; it cannot at its posterior part, where the tunica vaginalis is intimately incorporated or continuous with the tunica albuginea.

Q. What are the causes of hydrocele ?

A. It most commonly makes its appearance without any assignable cause ; occasionally it is produced by inflammation or contusions of the testicle. Sometimes it is a congenital affection.

Q. What diseases may be mistaken for hydrocele ?

A. Hernia, sarcocele, fungus hæmatodes, and anasarcous swelling of the scrotum.

Q. By what indications is hydrocele to be distinguished from sarcocele ?

A. In sarcocele, the tumour is heavy and extremely firm; generally irregular on its surface, and attended with pain; in hydrocele, it is soft, fluctuating, smooth on its surface, and accompanied with no pain.

Q. How is hydrocele to be distinguished from fungus hæmatodes of the testicle?

A. In this case, the diagnosis is sometimes difficult. Fungus hæmatodes, however, may commonly be known by attending to the history of the case; by the weight of the swelling; by its not being transparent; its commencing in the body of the testicle; by its being generally attended with an enlargement of the spermatic cord, and in its latter stage with disorder of the constitution.

Q. What are the diagnostic characters of anarsarcous swelling of the scrotum?

A. The tumour retains the impression of the finger; it has a soft doughy feel, and is often connected with ascites or anasarca.

Q. What is meant by hydrosarcocele?

A. When hydrocele is complicated with a morbid state of the glandular substance of the testicle, the disease is termed hydrosarcocele.

Q. How is hydrocele to be treated?

A. The treatment of hydrocele is divided into two kinds, the palliative and the radical.

Q. In what does the palliative consist?

A. It consists in merely evacuating the collected fluid by means of a trocar; the operation being repeated as often as the cavity of the tunica vaginalis becomes filled, and the scrotum distended to an inconvenient bulk.

Q. In what does the radical treatment consist?

A. It consists in not only discharging the serous fluid, but in preventing its return, by exciting such a degree of inflammation on the surfaces of the tunica albuginea and tunica vaginalis, as will either produce a permanent adhesion between these two membranes, by which the cavity of the latter may become obliterated; or as will entirely remove the morbid action of their secreting or absorbing vessels.

Q. By what methods is the radical cure effected ?

A. By laying open the tunica vaginalis throughout its whole extent, which is termed incision; by introducing a tent or seton into it ; by removing a small portion of its anterior part, which is denominated excision ; or by injecting some stimulating fluid into its cavity ; or lastly, by applying cold lotions to the scrotum.

Q. Which methods are the most eligible ?

A. The three last.

Q. In what cases of hydrocele are cold applications most successful ?

A. In those of very young subjects.

Q. Describe the operation of excision ?

A. The patient must be seated in a high chair, with his head and shoulders reclining backwards. The surgeon then makes a small incision into the tunica vaginalis, and after discharging the fluid, he draws out a portion of the membrane by means of a hook, and cuts it off with a pair of scissors.

Q. What are the effects of this operation ?

A. It generally produces sufficient inflammation to destroy the unhealthy action of the secreting or absorbing vessels of the tunica albuginea and tunica vaginalis, but seldom such a degree of it, as to cause these membranes to become united to each other by adhesion.

Q. Describe the operation of injection ?

A. The patient being seated as in the operation of excision, the surgeon grasps the scrotum in his left hand. He then takes a trocar in his right hand, and carefully introduces it at the anterior and inferior part of the swelling. As soon as the instrument has entered the cavity of the tunica vaginalis, he withdraws the stilet, and at the same time pushes the canula further in. When the serous fluid is discharged, a quantity of diluted port wine must be injected through the canula, until the scrotum is distended nearly to its former size. The injection must be allowed to remain in the sac for four or five minutes and then evacuated. This being done, the wound should be closed and the patient put to bed.

Q. In what direction should the trocar be pushed ?

A. Obliquely upwards. If pushed in a horizontal direction it would wound the testicle.

Q. What are the dangers occasionally resulting from this operation ?

A. The testicle is sometimes attacked with such violent inflammation, that it suppurates, and its structure becomes nearly or altogether destroyed ; and sometimes, the injection, owing to the canula slipping out, instead of passing into the cavity of the tunica vaginalis, is forced into the cellular membrane of the scrotum, in consequence of which, the parts inflame and suppurate, and in some cases mortify and slough away, leaving the testicles quite bare.

Q. What peculiarities are connected with congenital hydrocele ?

A. In congenital hydrocele, the communication between the abdomen and tunica vaginalis testis remains open, and the disease is sometimes complicated with congenital hernia.

Q. How is congenital hydrocele to be treated ?

A. The fluid should be pressed up into the abdomen, and a truss applied over the inguinal ring to prevent its return. In a short time it becomes absorbed, the communication between the cavity of the abdomen and that of the tunica vaginalis permanently closes, and the patient is entirely relieved from his complaint.

Q. If this treatment fail to remove the disease, what remedy should be advised ?

A. In this case, the radical method of cure should be had recourse to ; care being taken during the operation, to apply strong pressure over the inguinal ring, so that the injection may be prevented passing into the abdominal cavity, where probably its presence might excite dangerous inflammation.

RETENTION OF URINE.

Q. What are the symptoms of retention of urine?

A. When the flow of urine is completely obstructed, the fluid accumulates in the bladder and distends it to such a degree, that it rises up above the pubis, and forms a tumour, which can be felt occupying the hypogastric region, and sometimes extending as far as the umbilicus; the whole abdomen is tumid and painful when pressed on; the patient is affected with considerable fever; he has frequent inclinations to make water, but all his efforts to accomplish this, are unavailing and attended with the most excruciating agony. If relief be not administered, the bladder inflames and mortifies, the urine escapes into the abdomen, and death speedily ensues.

Q. What are the causes of retention of urine?

A. Atony, paralysis, over distension, inflammation, or hernia of the bladder; the pressure of the rectum, uterus, tumours, &c. on the neck of the bladder; foreign bodies lodging in the bladder; enlargement of the prostate gland; inflammation or stricture of the urethra; calculi or other substances lodging in this canal.

Q. How is retention of urine arising from atony of the bladder to be treated?

A. The urine should constantly be drawn off by the catheter, and in order to restore the tone of the bladder, cold water should frequently be dashed upon the pelvis, and the patient recommended to take the more stimulating and warmer kind of diuretics.

Q. In what manner should the disease be treated, if it be occasioned by paralysis of the bladder?

A. In this case, the surgeon should have recourse to the catheter, and at the same time endeavour to remove the original disease upon which the paralytic affection depends.

Q. What are the causes of paralysis of the bladder?

A. Concussion or other injuries of the spinal marrow. It sometimes occurs in paraplegia.

Q. What treatment is proper for retention of urine arising from over distension of the bladder?

A. The catheter should be introduced to draw off the accumulated fluid, and the contractile power of the bladder restored by the use of cold applications to the hypogastric region, and of blisters to the sacrum.

Q. How is retention of urine to be removed when it depends upon inflammation of the bladder?

A. The urine should in the first place be taken away by means of the catheter; the practitioner should then reduce the inflammation by bleeding, the warm bath, warm fomentations, oleaginous purges, glysters and spare diet.

Q. How is retention of urine, occasioned by hernia of the bladder to be treated?

A. In this instance, the urine should be drawn off by the catheter, the protruded bladder reduced and a truss applied; if the case be irreducible, the tumour should be supported by a suspensory bandage.

Q. What treatment does retention of urine require when it arises from diseases of the rectum?

A. If retention of urine be occasioned by the rectum becoming distended from piles, alvine concretions or flatus and pressing upon the neck of the bladder, it can only be effectually relieved by removing the primary disorder.

Q. What state of the uterus may give rise to retention of urine?

A. A gravid state of this organ, retroversion, or distension from an accumulation of menstrual fluid, or from tumours growing from its internal surface. The treatment in each of these cases consists, in repeatedly drawing off the urine by means of a catheter or bougie, until the cause of the retention be removed.

Q. What plan of treatment should be resorted to, in retention of urine arising from foreign bodies lodging in the bladder?

A. In the first place, a catheter should be introduced to push back the extraneous substance from the internal orifice of the urethra, and at the same time to draw off the urine. If the foreign body be small, it must be extracted through the urethra; if large, its removal can only be accomplished by cutting into the bladder.

Q. When inflammation or enlargement of the prostate gland occasions retention of urine, what should be done?

A. The bladder must first of all be emptied of urine by means of the catheter, and then proper measures adopted for the cure of the original complaint; if it be inflammation, recourse should be had to bleeding and other antiphlogistic remedies; if enlargement, frequent bleedings from the loins, mild aperients, opiates, the warm bath and a temperate mode of living, are to be recommended.

Q. When retention of urine is produced by inflammation or stricture of the urethra, what remedies should be employed?

A. When it is occasioned by the first cause, bleeding, the warm bath, and emollient injections ought to be prescribed; when by the second, venesection, the use of warm fomentations and other relaxants should constitute the curative process. In some cases of stricture, it is necessary to introduce the catheter before relief can be obtained; and if the obstruction in the urethra be so great as to prevent the accomplishment of this, the bladder must be punctured. Calculi lodging in the urethra and causing retention of urine should be extracted or cut out.

Catheter.

Q. Describe the method of introducing the male catheter?

A. The patient being laid in the recumbent position on the floor, or a bed, with his thighs separated and moderately bent on the pelvis, the surgeon lays hold of the penis between the fingers and thumb of his left hand. He then takes the catheter, previously immersed in warm water and oiled, in his right hand, and pushes it with its concavity towards the abdomen, gently along the urethra, at the same time stretching forward the penis. As soon as the instrument has reached the bulb of the urethra, the surgeon should suffer the penis to retract, and now slowly depressing the handle of the catheter between the patient's legs towards the anus, he conveys its point into the cavity of the bladder.

Q. What are the most common causes of impediment to the introduction of the catheter?

A. The introduction of the catheter is chiefly obstructed by the point of the instrument becoming entangled in a fold of the internal membrane of the urethra, or in one of its lacunæ; or by its being forced against the os pubis, in consequence of the surgeon too soon depressing its handle.

Q. What methods must be adopted to overcome these impediments?

A. No violence ought on any account to be used, but the catheter should be a little withdrawn, and then pushed on in a different direction; if this manœuvre do not succeed, the surgeon should introduce his left fore finger into the rectum, and raise the point of the instrument up into the neck of the bladder.

Q. What other obstacles are there besides those above mentioned, that oppose the free entrance of the catheter into the bladder?

A. Spasm of the muscles of the perinæum; enlargement of the prostate gland; and stricture of the urethra. The first of these impediments is removed by moderate friction applied to the part; the second is overcome by employing a catheter, the beak of which is longer and bent more upwards than those used in ordinary cases; the management necessary for the third has already been considered.

Q. Describe the method of introducing the female catheter?

A. The patient should be placed upon her back, with her knees bent, and her thighs separated. The surgeon then passing his left fore finger from the pubes down between the labia pudendi, places its point on the elevated meatus urinarius. This serves as a guide to the catheter, which should be firmly held between the thumb, fore and middle fingers of the right hand. As soon as the instrument is lodged in the urethra, it should be pushed forward in a horizontal direction into the bladder.

Puncturing the Bladder.

Q. How many methods are there of puncturing the bladder?

A. Three; through the rectum, above the pubis, and by the perinæum.

Q. Which of these methods is generally considered the most eligible?

A. The first. The others have their advocates, and under certain circumstances are to be preferred.

Q. Describe the method of puncturing the bladder through the rectum?

A. The patient must be placed as in the operation of lithotomy. The surgeon then seats himself in a low chair, and introducing the fore finger of his left hand into the rectum, carries its extremity beyond the prostate gland; he now takes a long curved trocar in his right hand, and sliding it carefully along the thenal aspect of the left index finger, he pushes it through the coats of the distended bladder, in the triangular space included between the vesiculæ seminales and peritoneum. As soon as the urine begins to flow, the stilet should be withdrawn, the canula pushed further up, and retained by means of tape passed round the thighs.

Q. In what cases is this operation inadmissible?

A. In cases of diseased rectum or enlargement of the prostate gland.

Q. Describe the method of puncturing the bladder above the pubes?

A. The patient must be placed in a reclining position with his thighs bent upon the pelvis. The surgeon then makes a small incision between the pyramidales muscles about an inch and a half above the symphysis pubis. He now takes a common trocar, and guiding it by his left index finger introduced into the wound, pushes it obliquely downwards and backwards into the cavity of the bladder. After the stilet is withdrawn and the urine evacuated, the canula should be fixed with proper tapes. In a few days it will be necessary to take away the canula, to prevent incrustations forming upon its surface. Previous to its removal, however, an elastic gum catheter should be conveyed through its tube into the bladder.

Q. What is the great disadvantage attending this operation?

A. The urine, owing to the situation of the external wound, cannot readily flow through the canula; it therefore, sometimes escapes into the cellular substance, and produces inflammation and gangrene.

Q. Describe the method of puncturing the bladder by the perinæum?

A. The patient being placed as in lithotomy, an assistant presses down the bladder towards the pubes. The surgeon then makes an incision an inch and a half in length on the left side of the raphe of the perinæum, between the crus penis and bulb of the urethra. Having laid bare the prostate gland, he now takes a straight trocar three inches and a half long, and passing it cautiously along the fore finger of his left hand inserted into the wound, pushes it through the coats of the distended bladder.

Q. What are the objections to puncturing the bladder by the perinæum?

A. The operation is more difficult to execute than either of the other above described, and more frequently followed by extravasation of urine into the cellular substance; in performing it too, the surgeon runs great risk of wounding the vas deferens, vesiculæ seminales, ureter, prostate gland or rectum.

LITHOTOMY.

Q. What symptoms are indicative of stone in the bladder?

A. Itching or an uneasy sensation in the glans penis, which causes the patient to squeeze and pull forward the prepuce; pain along the urethra, generally most severe opposite the frænum præputii, and always much increased immediately after making water; obtuse pain in the neck of the bladder and lower part of the abdomen, coming on in violent paroxysms, extending to the loins and hypochondria, and greatly aggravated by riding on horse-back or in a carriage; frequent inclination to void the urine, which is commonly purulent, sabulous or bloody, particularly after taking exercise, and is often discharged by drops or in very small quantities; if it be passed in a full stream, the current is suddenly stopped before the bladder is entirely emptied, but flows again as soon as the position of the body is changed. These symptoms are for the most part accompanied with disorder of the gastric system, fever, tenesmus, numbness of the thigh and retraction of the testicle.

Q. What reason can be assigned for the pain becoming more severe immediately after voiding the urine?

A. The increase of pain, which is experienced directly after making water, arises from the internal surface of the bladder coming in close contact with, and embracing the rough surface of the stone.

Q. To what is the sudden stoppage of the urine to be ascribed?

A. To the calculus falling against the internal orifice of the urethra. When the patient alters his position, the calculus is removed into another place and the urine again flows out.

Q. May the symptoms just enumerated, be produced by any other disease than stone in the bladder?

A. Yes; they may be occasioned by enlargement of the prostate gland; by inflammation of the bladder or neighbouring parts; by scirrhosity of the bladder, or by tumours growing from its internal surface.

Q. By what means then, is the surgeon to decide, whether a stone really exists in the bladder or not?

A. Although the symptoms above mentioned afford strong presumptive evidence of stone in the bladder, yet, as they accompany other diseases, the existence of a vesical calculus can only be correctly ascertained by means of the sound.

Q. How is enlargement of the prostate gland to be distinguished from stone in the bladder?

A. The pain from an enlarged prostate gland is not increased by the motion of a horse or carriage, never comes on in paroxysms, and is never so acute as that produced by a calculus lodging in the bladder.

Q. How is the sound to be introduced?

A. Precisely in the same manner as the catheter, and it should never be withdrawn from the bladder until it has several times been made to strike the surface of the stone.

Q. If the stone cannot be readily felt, what should be done?

A. In this case, the extremity of the sound, as soon as it has entered the bladder, should be carefully moved about in various directions, and sometimes it will be necessary to introduce the finger into the rectum, and raise up the stone, to bring it within reach of the instrument. The patient should be sounded while placed in different attitudes, and both in the full and empty state of the bladder.

Q. How many kinds of urinary calculi have been discovered?

A. Eleven: viz. the uric acid calculus; the phosphate of lime calculus; the triple or ammoniaco-magnesian phosphate calculus; the fusible calculus; the oxalate of lime or mulberry calculus; the cystic oxyde calculus; the alternating calculus; the compound calculus; the prostate gland calculus; the xanthic oxyde calculus; and the fibrinous calculus.

Q. Which of these are most commonly found in the bladder?

A. The uric acid calculus; the phosphate of lime calculus; the ammoniaco-magnesian phosphate calculus; the oxalate of lime calculus and the cystic oxyde calculus.

Q. Are calculi generally found loose or fixed in the bladder?

A. They are commonly found loose and moveable; occasionally, however, they are imbedded in preternatural pouchés, or situated between the folds, or among the muscular fasciculi of the bladder.

Q. May calculi exist in the bladder without creating pain or inconvenience?

A. Yes; this circumstance has frequently been known to occur, and occasionally, small or smooth stones give more pain than large or rough ones.

Q. What effects are produced on the urinary organs by calculi lodging in the bladder?

A. Stone in the bladder occasions inflammation, thickening or ulceration of the coats of this organ; and not unfrequently inflammation, swelling and suppuration of the ureters or kidneys.

Q. What treatment ought to be prescribed for patients about to undergo the operation of lithotomy?

A. They should be confined for several days to the horizontal posture, directed to live very abstemiously, and to take occasional doses of some mild aperient; in very plethoric habits, venesection will be adviseable. An hour before the operation, the rectum should be evacuated by an oleaginous enema.

Q. Is lithotomy more easily performed when the bladder is empty or when it contains a portion of urine?

A. When it contains a portion of urine; and therefore, the patient should avoid making water an hour or two before undergoing the operation.

Q. How many methods are there of performing lithotomy?

A. Three; by the perinæum, above the pubis, and through the rectum; the first is termed the lateral operation, the second, the high operation, and the third, the posterior or recto-vesical operation.

Lateral Operation with the Knife.

Q. How should the patient be placed in the lateral operation?

A. After the perinæum is shaved, he should be laid on a firm table with his nates projecting somewhat beyond its edge; his head and shoulders should be elevated a little by pillows, and after the staff is introduced into the bladder, and the stone distinctly felt, his hands and feet should be tied together by means of broad tapes, and his thighs separated by two assistants.

Q. In what position should the staff be held?

A. The end of the staff should project about two inches into the bladder, and be made to rest if possible on the stone; its handle should be held nearly in a perpendicular direction, and somewhat inclined towards the right groin. The instrument when properly adjusted should be committed to the charge of a steady assistant, who stands on the dextral side of the patient, and with his left hand supports the scrotum.

Q, After these preliminary steps are finished, how should the surgeon proceed?

A. As soon as he has properly fixed the staff, he should seat himself on a stool of such a height, that his breast may be opposite the patient's breech; he should then stretch the integuments of the perinæum with the fingers and thumb of his left hand, and divide them with one stroke of the scalpel.

Q. Where is the first incision through the integuments to be made?

A. On the left side of the raphe of the perinæum.

Q. At what point should it commence?

A. It should commence nearly an inch and a half above the anus, and a finger's breadth on the mesial or inner side of the ascending ramus of the left os ischium.

Q. In what direction should it be carried?

A. It should be carried obliquely downwards and outwards, between the tuberosity of the ischium and the anus, and made to terminate an inch and a half below the latter.

Q. Of what length should the external incision generally be made in adults?

A. About three inches and a half.

Q. What is the next step of the operation after the external incision is completed?

A. As soon as the incision through the integuments is finished, the surgeon should cut between the crus penis and bulb of the urethra; he should then, after pushing the latter aside with his left fore finger to prevent its being injured, divide the transversales perinæi muscles, the cellular substance and a portion of the levator ani, so as completely to lay bare the membranous part of the urethra; taking especial care, during the whole of this dissection, to press down the rectum and defend it from the knife by means of his middle finger introduced into the wound.

Q. Describe the remaining part of the operation?

A. As soon as the membranous portion of the urethra is laid bare, the operator makes a small incision into it so as to expose the staff, into the groove of which, he immediately inserts the nail of his left fore finger; he now turns the back of his knife upwards, and fixing its point in the groove, pushes it onwards through the prostate gland into the bladder, guiding it all the while by his left index finger placed beneath its cutting edge. When the cavity of the bladder is laid open to a sufficient extent, the knife should be withdrawn, the forceps introduced, the staff removed, and finally the stone laid hold of and extracted.

Q. In what direction should the edge of the knife be inclined, while cutting through the substance of the prostate gland?

A. It should be inclined obliquely downwards and outwards, but when it has divided the gland and entered the cavity of the bladder, it should be turned in a lateral direction. By this manœuvre, the incision is made of a semilunar figure, and sufficiently large to admit of the extraction of a large stone.

Q. In what manner should the forceps be introduced into the bladder?

A. They should be kept closed and conducted along the left index finger, which must be inserted into the wound as soon as the knife is withdrawn.

Q. When should the staff be taken away?

A. Not until the blades of the forceps are fairly lodged within the bladder.

Q. At what part of the bladder does the stone generally lie?

A. At its inferior and posterior part. As soon as its situation is discovered, it should be grasped by the forceps in its smallest diameter, and then extracted; if not easily got hold of, it should be raised up by the finger passed into the rectum.

Q. Are there ever more than one calculus lodged in the bladder?

A. Yes; sometimes several. The surgeon, therefore, as soon as he has extracted one, should pass his fore finger into the bladder and carefully feel that another does not remain behind; if this happen to be the case, it must be removed in the same manner as the first.

Q. By what circumstances is the extraction of the stone chiefly impeded?

A. By its own very prodigious bulk, by its being seized with the forceps in a transverse position, by the small size of the wound, and by the contraction of the bladder.

Q. What should be done in each of these cases?

A. When the stone is of very considerable magnitude, it should be broken, and after the larger pieces are taken away, the smaller fragments should be washed out with tepid water, or removed with the scoop; when grasped in its longest diameter, it should be released from the forceps, and then again laid hold of in a more convenient direction; when the wound is too small, it should be enlarged by a probe pointed bistoury.

Q. How should the surgeon proceed when the extraction of the stone is obstructed by the bladder spasmodically contracting upon it ?

A. He ought on no account to persist in using any violent measures, but should administer an anodyne, return his patient to bed, and bring away the stone when the parts have become relaxed.

Q. When the stone is imbedded in a cyst, how is its removal to be accomplished ?

A. In this case the cyst should first of all be opened by means of a coupe-bride. The surgeon should then introduce the forceps, lay hold of the stone and extract it.

Q. What parts are divided in the lateral operation of lithotomy ?

A. The skin, cellular membrane, accelerator urinæ, transversus perinæi, and transversus perinæi alter muscles ; part of the levator ani, membranous portion of the urethra, prostate gland, and neck of the bladder.

Q. What artery is divided in this operation ?

A. The transversa perinæi, a branch of the arteria pudica, it lies under the transversus perinæi muscle.

Q. What arteries are in danger of being wounded ?

A. The artery of the bulb of the urethra, and the common pudic artery.

Q. What other important parts may be wounded ?

A. The rectum, vesiculæ seminales, and fundus of the bladder.

Q. Are there any other dangerous consequences arising from the operation of lithotomy.

A. Yes ; it is sometimes succeeded by peritonitis or extravasation of urine into the cellular membrane, producing inflammation, suppuration or gangrene.

Q. When does the operator wound the artery of the bulb of the urethra ?

A. When he begins the external incision too near the arch of the pubis or more than an inch and a half above the anus.

Q. When does he wound the common pudic artery ?

A. When he cuts too much in a lateral direction, in dividing the prostate gland.

Q. By what means is the hæmorrhage from the common pudic artery to be suppressed?

A. By securing the wounded vessel in a ligature, or by compressing it with a piece of firm sponge introduced into the wound.

Q. What circumstances occasion extravasation of urine?

A. Extravasation of urine most commonly happens when the external incision is made too near the arch of the pubis, and not carried down sufficiently far beyond the anus; it is also sometimes produced, by coagulated blood obstructing the opening into the bladder, or by the lips of the wound becoming excessively swollen.

Q. What plan of practice should be pursued in order to prevent extravasation of urine?

A. If the urine be observed, a few hours after the operation, not to have escaped at the external wound, a free outlet for it should immediately be obtained, by introducing the finger into the bladder and dislodging the coagulated blood; or if necessary, by enlarging the external incision.

Q. How is the patient to be treated after the operation?

A. He should be laid in bed upon his back, his thighs should be bound together, and the wound superficially dressed. All kinds of stimulating food and drink should be prohibited, and if symptoms of peritonitis appear, they must be subdued by the usual remedies.

Lateral Operation with the Lithotome Caché.

Q. Describe the method of performing the lateral operation with the lithotome caché?

A. The membranous part of the urethra being opened in the manner already directed, the surgeon fixes the beak of the lithotome caché in the groove of the staff; then rising from his seat he takes the staff in his left hand, and whilst he brings it towards himself, he pushes the lithotome forwards into the bladder, depressing its handle as much as possible. The staff is now to be removed; this done, the concealed blade of the lithotome must be raised from its sheath, and its cutting edge inclined downwards and outwards; the instrument should then be withdrawn in a horizontal manner so as to divide the prostate gland and neck of the bladder. The operation must be finished in the same manner as when the knife is employed.

Q. On what accounts has the use of the lithotome caché been objected to?

A. Because it frequently makes the opening through which the calculus is to be extracted, too small, and is also very apt to cut the fundus of the bladder, or wound the pudic artery.

Lateral Operation with the Gorget.

Q. Describe the method of performing the lateral operation with the gorget?

A. As soon as the surgeon has made an opening into the membranous part of the urethra, he fixes the beak of the gorget in the groove of the staff; he then rises from his seat, and taking hold of the handle of the latter instrument with his left hand, he depresses it towards himself, and at the same time pushes the former onwards into the bladder. When the incision is completed, the staff should be withdrawn, the forceps introduced, and the stone extracted.

Q. What objections have been advanced against the use of the gorget?

A. The gorget is objectionable on the following accounts. 1. It divides the prostate gland more at its upper than its lateral part, owing to which, the opening into the bladder is too near the arch of the pubis, and consequently so confined, that the extraction of the stone is generally attended with considerable difficulty. 2. It is very apt to wound the pudic artery, the rectum, or fundus of the bladder. 3. It sometimes slips from the groove of the staff, and passes between the bladder and rectum.

Operation above the Pubes, or the High Operation.

Q. Describe the usual manner of performing the high operation ?

A. The patient must be laid on a square table with his thighs somewhat bent on the pelvis, and his back and shoulders well supported by pillows ; an incision four inches in length should then be made along the mesial line through the integuments at the inferior part of the abdomen ; this lays bare the linea alba, which should be divided in the direction of the external wound for about three inches ; the two recti and pyramidales muscles are next to be separated from each other, and the latter a little detached from their origins. The surgeon now passes a sonde à dard along the urethra into the bladder, and pushes the point of its stilet through the coats of this viscus into the external wound ; he then fixes a probe-pointed bistoury in the groove of the stilet, and enlarges the opening in the fundus of the bladder by cutting towards the pubes ; this being done, the left index finger should immediately be placed between the lips of the incision, to bear up the coats of the bladder, which otherwise would contract and shrink away as soon as the urine had escaped ; the sonde à dard should then be withdrawn, the forceps introduced, and the stone extracted ; after the operation, a piece of simple dressing should be applied to the wound, an elastic gum catheter passed into the bladder, and the patient put to bed.

Q. With what disadvantages is the high operation attended ?

A. The high operation is very frequently succeeded by peritonitis, or extravasation of urine into the cellular membrane, and it is difficult to perform, or even quite impractacable, when the patient is very fat, or the bladder so much thickened and contracted, that its fundus cannot be made to rise above the pubes.

Q. When is it preferable to the lateral operation ?

A. In those cases where large calculi are to be extracted, and where the urethra or prostate gland is in a state of disease.

Operation through the Rectum, or Posterior Operation.

Q. Describe the method of performing the posterior or recto-vesical operation ?

A. The patient being placed as in the lateral operation, a grooved staff must be passed along the urethra into the bladder, and held perpendicularly by an assistant, who stands on the sinistral side of the patient. The surgeon now introduces his left fore finger into the rectum, and conveys along its thenal surface the flat side of a common bistoury ; he then turns the sharp edge of the instrument upwards, and drawing it towards himself in the direction of the raphe of the perinæum, divides the lower part of the rectum and sphincter ani. This incision lays bare the prostate gland, beyond which, the staff is easily felt through the rectum and bladder ; the bistoury should now be again introduced, and as soon as its point is fixed in the groove of the staff, it should be pushed along it, so as to make an opening through the coats of the bladder an inch in length ; this being finished, the operator withdraws the knife, introduces the forceps, and removes the stone.

Q. What parts are divided in this operation ?

A. The sphincter ani, the lower part of the rectum, the posterior part of the prostate gland, and the inferior part of the bladder.

DISEASES OF THE ARTERIES.

Q. What are the diseases of the arteries ?

A. Inflammation, ossification, a deposition of pultaceous matter between their muscular and serous coats, dilatation, and aneurism.

Aneurism.

Q. Give a definition of aneurism ?

A. Aneurism is a pulsating tumour occasioned by a preternatural dilatation, or rupture of the coats of an artery, and filled with arterial blood.

Q. Is the blood contained in aneurismal tumours in a fluid or coagulated state ?

A. In some instances it is entirely fluid ; in others partly fluid and partly coagulated, and generally out of the track of the circulation.

Q. How many kinds of aneurism are there ?

A. Four ; viz. true aneurism, false aneurism, varicose aneurism, and aneurism from anastomosis.

True Aneurism.

Q. What is meant by true aneurism ?

A. True aneurism, during the first stage, consists in a permanent and uniform dilatation of all the coats of an artery ; in the second stage, the internal and middle coats ulcerate and give way, and the external alone continues to be dilated into an aneurismal swelling.

Q. Into how many varieties is true aneurism divided ?

A. Into two ; the circumscribed and the diffused. The former is the most common.

Q. At what period of life does true aneurism most frequently occur ?

A. In old age.

Q. In what arteries does it commonly present itself ?

A. In the aorta, the iliac, femoral, popliteal, carotid, subclavian, and axillary arteries. It never occurs in the smaller class of arteries.

Q. Describe the symptoms and progress of true external aneurism ?

A. True external aneurism, first commences with a strong pulsation in the situation of a large artery ; this is succeeded by the appearance of a small, soft, pulsating tumour, which vanishes upon pressure, but returns as soon as the pressure is removed. In its early stage, it is attended with no pain, or discolouration of the integuments. As the disease advances, the internal and middle coats of the artery yield under the impulse of the blood; the swelling now bounded by the external coat alone, rapidly enlarges, its pulsations grow less perceptible, it acquires greater firmness from the increasing coagulation, and is nearly or altogether incapable of being reduced by pressure. The external or cellular arterial coat next gives way, and the blood comes in contact with the sheath of the vessel, which in its turn also is ruptured, or removed by absorption; the tumour now daily increasing, presses upon, and destroys the surrounding parts; it obstructs the lymphatic and venous circulation, and compresses the large nerves, in consequence of which, the limb becomes edematous, cold, extremely painful, and sometimes paralytic, at last, the aneurism grows very tense and prominent, a livid spot appears on its surface, its walls then give way, the blood gushes out through the aperture, and the patient is speedily destroyed.

Q. What are the causes of true aneurism?

A. The principal cause is a diseased, or ossified state of the arterial coats. Aneurismal swellings are sometimes occasioned by external violence, but this alone is insufficient to produce laceration of the coats of an artery, and cause aneurism, unless they are in a previously unhealthy condition.

Q. Which coat is the seat of ossification?

A. The serous coat. The ossific matter is usually found deposited in small specks on various parts of its peripheral or outer surface.

Q. In what direction are the coats of an artery generally ruptured?

A. Generally in a transverse direction. In some instances, the rupture is longitudinal.

Q. In what does the medical treatment of true aneurism consist?

A. In bleeding, the exhibition of purgative medicines, in spare diet, rest, and the use of digitalis.

Q. How many surgical methods of cure are there?

A. Two; compression and the ligature.

Q. Explain how venesection and other debilitating remedies, effect the cure of aneurism?

A. They diminish the force of the general circulation, and by that means, promote the coagulation of blood in the aneurismal sac, whereby its cavity gradually becomes obliterated.

Q. In what manner does compression accomplish the cure of aneurismal swellings?

A. In the first place, it interrupts the influx of blood into the aneurismal sac, and thus causes its cavity to contract. The channel of the artery being obstructed by the pressure, and by the coagulation of blood, after the lapse of a longer or shorter period, becomes entirely impervious; the lateral anastomosing branches then enlarge, and carry on the circulation, the coagula are gradually removed by absorption, and the whole tumour at length disappears.

Q. What other remarks have you to offer with regard to compression?

A. Compression should always be applied to the artery a few inches above the tumour. It is most successful when employed in the early stage of aneurism, and its operation is greatly assisted by depletion and abstinence. It is quite ineffectual, if a large anastomosing branch pass off between the swelling and point of compression, as the influx of fresh blood into the sac, must in this case still continue as copious as ever.

Q. Is not the ligature preferable to compression?

A. Yes; it is not only a less painful, but a more speedy and effectual remedy.

Q. What other observations have you to make relative to the ligature?

A. The ligature should be applied to the artery, either as it enters, or passes out from the tumour, and should always be pulled sufficiently tight, to divide the internal and middle coats of the vessel. Only one ligature should be used, except when the sac is opened;

in this case, two are required, one above, and the other below the arterial aperture; the ligature, like compression, proves unsuccessful if a large anastomosing branch be given off betwixt it and the aneurismal sac, or from the sac itself.

Q. What consequences ensue, if the ligature be applied immediately below the origin of a large lateral branch?

A. In this case, no coagulum is formed, on which account, hemorrhage takes place, as soon as the ligature has cut its way through the coats of the artery.

Q. On what day should the ligature be removed?

A. On the fourth or fifth day after its application.

Q. How should the artery be managed?

A. It should be detached as little as possible from its surrounding connexions, and carefully separated from the vessels and nerves that accompany it.

Q. Is aneurism ever cured spontaneously?

A. Yes.

Q. Explain in what manner the spontaneous cure of aneurism is effected?

A. The spontaneous cure of aneurism is effected by four different processes. First. Sometimes the aneurismal swelling violently inflames and falls into gangrene; in this case, the artery partakes of the inflammation, its channel becomes obliterated by coagulating lymph, and the current of blood through the tumour is obstructed; the circulation is then carried on by the enlarged anastomosing branches, and a permanent cure is effected. Second. When the cavity of the aneurismal sac has become quite filled with firm coagula, it ceases to have any communication with the artery from which it arises; no further deposition can therefore take place, the contents of the sac are gradually absorbed, the artery remains pervious, the blood circulates through it as usual, and thus a cure is accomplished. Third. When the successive layers of coagula have completely filled the aneurismal sac, they sometimes continue to be deposited within the artery, so as at length to render its caliber impervious as far as the origin of the next large branches above and below the tumour, in consequence of which, the blood is forced into the collateral branches, and the aneurism cured. Fourth. When the aneurismal tumour presses upon the artery, either above or below the sac, it obstructs its channel, produces adhesion of its sides, and obliterates its cavity; the blood then flows into the lateral anastomosing branches, and a cure takes place.

Q. By which process does nature most commonly effect the cure of aneurism?

A. By the third process.

Q. By what means is the spontaneous cure of aneurism assisted?

A. By depleting remedies conjoined with a rigourously abstemious regimen.

False Aneurism.

Q. What do surgeons understand by false aneurism?

A. False aneurism is produced when all the three coats of an artery are punctured or burst, and the blood is effused into the adjoined cellular substance, which becomes distended, and raised into a pulsating tumour.

Q. How is false aneurism divided?

A. Into two kinds; the circumscribed and diffused.

Q. What are the symptoms of false aneurism?

A. They do not differ essentially from those of true aneurism.

Q. Are there no indications by which you can distinguish false from true aneurism?

A. Yes; in false aneurism, the tumour is less readily made to disappear by pressure, and returns more gradually when the pressure is removed, than in true aneurism; the pulsation of the swelling is also generally more feeble and indistinct, and sooner becomes imperceptible in the former, than in the latter species of the disease.

Q. What treatment does false aneurism require?

A. The same as that already recommended for true aneurism.

Q. Is not the operation more successful in false than in true aneurism?

A. Yes; because the latter is generally connected with a diseased state of the arterial system.

Varicose Aneurism.

Q. What is meant by varicose aneurism?

A. Varicose aneurism is produced by transfixing a large subcutaneous vein, and wounding an artery which lies immediately beneath it, so that a direct and permanent communication is formed between the two vessels, and the arterial blood instead of escaping into the cellular substance, passes with a hissing noise into the cavity of the vein, and distends it into a tumour.

Q. What appearances does the tumour in varicose aneurism present?

A. The tumour in varicose aneurism is small, always circumscribed, and of an oblong figure; it vanishes when pressed upon, but instantly reappears as soon as the pressure is taken off; instead of a full distinct pulsation, it has a jarring tremulous motion, accompanied with a hissing sound; its bulk is diminished by compressing the artery that supplies it; it is attended with no pain, and produces no change of colour, nor inflammation of the skin; it enlarges very slowly, and often remains stationary for a great number of years.

Q. How is varicose aneurism to be treated?

A. When the case is recent, the tumour small, and both vessels lie above, and close to a bone, compression generally succeeds in effecting a cure; but, when the disease is of long standing, it is better for the surgeon not to interfere, as the tumour, if left to itself, is seldom productive of inconvenience, or any serious results. If it should be accidentally cut, or burst by external violence, the artery should be exposed, and tied both above and below the puncture.

Q. Is varicose ever complicated with false aneurism?

A. Yes; this circumstance arises from the arterial and venous punctures not being exactly in the same direction, so that the arterial blood is injected into the adjoining cellular substance before it enters the vein.

Q. How is this complication to be detected ?

A. By the tumour from being at first circumscribed, becoming diffused, by its rapidly increasing in size, by its not yielding readily to pressure, and, by its being attended with pain and inflammation.

Q. In what manner is this complicated case to be treated ?

A. If the false aneurism, which is conjoined with the aneurismal varix, be circumscribed, the artery should be laid bare and tied above the tumour ; but if it be of the diffused kind, the tumour must be opened, and two ligatures applied, one above, and the other below the arterial puncture.

Aneurism from Anastomosis.

Q. What is understood by aneurism from anastomosis?

A. It is a pulsating tumour, occasioned by a morbid enlargement of a congeries of the smaller arteries and veins.

Q. Describe its symptoms and progress ?

A. The tumour is of a livid colour, and generally commences in the form of a small pimple, which gradually increases, and not unfrequently attains to a considerable magnitude ; its pulsations become more violent during exercise, mental agitation, or the flow of the catamenia. If the swelling be not extirpated, its parietes eventually give way, the blood is discharged in great profusion, and the patient, if not destroyed, is exceedingly debilitated.

Q. What are the causes of aneurism from anastomosis ?

A. For the most part it is occasioned by contusions and other external injuries. Sometimes, it is a congenital disease.

Q. What treatment does this species of aneurism require ?

A. The tumour should be removed with the knife; if it be very large, or extirpation seem impracticable, it may be cured by tying the principal arterial trunks, which lead to the seat of the disease.

Aneurism of the Aorta.

Q. Which parts of the aorta are most frequently affected with aneurism?

A. The arch of the aorta, and that part of it whence the cœliac artery arises.

Q. What are the symptoms of aneurism of the thoracic aorta?

A. The patient first complains of violent palpitations in the chest, accompanied with difficult respiration, and irregularity of the pulse. These symptoms are succeeded by the appearance of a pulsating tumour at the upper part of the thorax, which, as it increases in size, compresses the trachea, lungs, œsophagus, and large thoracic veins; producing incessant cough, laborious breathing, painful deglutition, and lethargy. If it acquires a very enormous bulk, it dislocates by its pressure the ends of the clavicles, and forces its way through the ribs and sternum; in some instances it even destroys the vertebræ, and affects the spinal marrow; when it bursts internally, the blood is effused either into the cavity of the chest, or pericardium; into the œsophagus; the trachea; the air cells of the lungs; or into the right auricle of the heart; and the patient expires instantaneously.

Q. Does the swelling ever burst externally?

A. Yes.

Q. What diseases may be mistaken for thoracic aneurism?

A. Diseases of the lungs and œsophagus; carotid aneurism and aneurism of the arteria innominata. The symptoms of thoracic aneurism in the early stage of the disease, are very similar to those of phthisis pulmonalis.

Q. What are the symptoms of aneurism of the abdominal aorta ?

A. This disease commences with a violent beating and pain in the belly, accompanied with disorder of the abdominal viscera, and difficulty of breathing ; at length a large pulsating swelling appears externally ; the patient becomes affected with anasarca ; incontinence of urine ; and sometimes, with paralysis of the lower extremities, and generally dies before the walls of the aneurism give way.

Q. Into what parts is the blood effused, when aneurism of the abdominal aorta bursts ?

A. Into the stomach, duodenum, or between the layers of the mesentery.

Q. How are aneurisms of the aorta to be treated ?

A. Aneurisms of the aorta have frequently been cured by repeated venesection, and the use of purgative medicines, in conjunction with a temperate mode of living and confinement to bed.

DIRECTIONS FOR TYING THE PRINCIPAL ARTERIES.

To Tie the Carotid Artery.

Q. Describe the course of the carotid artery ?

A. The carotid artery in its passage from the thorax to the head, runs by the side of the trachea. The internal jugular vein is situated on its lateral or outer aspect ; behind it, lie the par vagum and great sympathetic nerves ; the descendens noni is before it. At the lower and middle parts of the neck, it is concealed by the sterno-cleido-mastoideus muscle ; at the atlantal or upper part, it is covered only by the skin, platysma myoides, glands, and cellular membrane.

Q. Describe the method of tying the carotid artery ?

A. The surgeon should commence his incision opposite the upper part of the thyroid cartilage, and continue it towards the sternum, along the mesial or inner border of the sterno-cleido-mastoideus muscle, for about three inches. After the integuments and platysma myoides are divided, the omohyoideus, which crosses the lower angle of the wound, should be separated from the sterno-cleido-mastoideus. An assistant should now compress and draw aside the internal jugular vein, while the surgeon opens the sheath of the artery on its tracheal or inner aspect.

Q. In what direction should the ligature be passed under the artery?

A. From the lateral or outer, to the tracheal or inner side of the vessel.

The Subclavian Artery.

Q. In how many situations may the subclavian artery be tied?

A. In two; above and below the clavicle.

Q. Describe the situation of the subclavian artery above the clavicle?

A. The vessel at this part, after having emerged from between the anterior and middle scaleni muscles, runs beneath the subclavian to get to the axilla. It is covered by the skin, platysma myoides, and cellular membrane; the cervical nerves are situated above, and somewhat behind it; the subclavian vein passes along its sternal or anterior aspect, and is separated from it by the anterior scalenus muscle.

Q. Describe the method of tying the subclavian artery above the clavicle?

A. A line should be drawn above the clavicle, from its sternal to its acromial extremity. Along this line the first incision must be made; it should commence at the lateral or outer margin of the clavicular origin of the sterno-cleido-mastoideus, and terminate at the edge of the trapezius, where this muscle is inserted into the clavicle; after the integuments are divided, the surgeon should next cut through the platysma myoides, taking care not to wound the external jugular vein, which ought to be drawn aside with a blunt hook; he should then dissect with the handle of his knife through the cellular membrane in the middle of the wound; as soon as he has reached the anterior scalenus muscle, he should glide his finger along its lateral or outer margin, down to the first rib, where he feels the artery, and ties it.

Q. Can the subclavian artery be tied on the inner or tracheal side of the anterior scalenus muscle?

A. Yes. The operation, however, is a very dangerous one, and difficult to perform, and has hitherto proved unsuccessful?

Q. Mention the very important parts which surround the subclavian artery on the tracheal side of the scalenus muscle?

A. The pleura, lies in close contact with it; and the vertebral, inferior thyroid and internal mammary arteries are situated in its immediate vicinity; the par vagum, phrenic nerve, and subclavian vein pass before it; behind it, is the lower cervical sympathetic ganglion; on the dextral side, the recurrent nerve encircles it; on the left, this nerve runs between it and the œsophagus; on the left side, the thoracic duct also descends over the subclavian artery.

Q. Describe the situation of the subclavian artery below the clavicle?

A. The vessel after it has escaped from under the clavicle, passes behind or on the dorsal aspect of the pectoralis minor, not far from the insertion of this muscle. The subclavian vein runs before and a little below the artery; one of the cervical nerves lies above, and the rest behind it.

Q. Describe the usual manner of tying the subclavian artery below the clavicle?

A. A semilunar incision, having its convexity downwards, should be made through the integuments covering the clavicular portion of the pectoralis major; it should commence an inch from the sternal extremity of the clavicle, and terminate just before the thenal or anterior margin of the deltoid muscle; as soon as the fibres of the pectoralis major are exposed, they should be divided, and then reflected upwards. This part of the operation brings into view the pectoralis minor, which crosses the lateral, or outer angle of the wound. In the space between the upper edge of the pectoralis minor and the clavicle, the artery should be laid hold of and tied; care being taken to separate the vessel well from the surrounding parts before applying the ligature.

Q. What important vein may be wounded in the first incision?

A. The cephalic.

The Axillary Artery.

Q. What is the situation of the axillary artery?

A. The axillary artery is surrounded by the axillary plexus of nerves, which is situated immediately under the integuments of the arm-pit.

Q. Describe the method of tying the axillary artery?

A. The patient's arm being raised, an incision three inches in length should be made through the integuments, exactly over the middle of the head of the os brachii; the axillary vein first presents itself, then the median nerve, behind which, is the artery; the vessel before it is included in the ligature, should be carefully freed from the important parts adjoining it, by the handle of the knife.

The Brachial Artery.

Q. Describe the situation of the brachial artery, a little above the elbow?

A. The brachial artery at this part, lies under the skin and fascia, between its two venæ comites, close to the inner edge of the biceps flexor cubiti muscle. The triceps extensor cubiti is situated on its anconal or posterior aspect; on its ulnar side is the median or radial nerve, and near to this is the vena basilica.

Q. Describe the operation of tying the brachial artery?

A. The surgeon should commence his incision three fingers-breadth above the inner condyle of the humerus, and extend it upwards towards the axilla, along the inner edge of the biceps flexor muscle, for about two inches and a half. The artery is found immediately beneath the fascia, in the situation above described.

Q. In what direction should the aneurismal needle be passed under the brachial artery?

A. From the ulnar or inner, to the radial or outer side, in order to avoid including the median nerve in the ligature.

The Ulnar Artery.

Q. Describe the situation of the ulnar artery, at the upper third of the fore-arm?

A. The artery at this part runs between the flexor digitorum sublimis, and the flexor digitorum profundus, the former being situated on its thenal or anterior, and the latter, on its anconal or posterior aspect; the flexor longus pollicis, lies on its radial, and the flexor carpi ulnaris, on its ulnar side.

Q. Where is the ulnar nerve situated?

A. The ulnar nerve passes down along the ulnar side of the ulnar artery.

Q. Describe the proper manner of tying the ulnar artery, at the upper third of the fore-arm?

A. The surgeon should begin his incision two inches below the ulnar condyle of the humerus, near the inner edge of the ulna, and carry it downwards, in a straight direction, for about three inches; as soon as the integuments and fascia are divided, the palmaris longus presents itself, and beneath this is the flexor digitorum sublimis; the ulnar or inner edges of these two muscles, which lie on the outer side of the wound, after being separated from the radial or outer edge of the flexor carpi ulnaris, which lies on its inner side, are to be somewhat raised, when the artery will be brought into view.

Q. What is the situation of the ulnar artery at the wrist?

A. The ulnar artery at this part lies covered by the skin and fascia, between the tendons of the flexor digitorum profundus, and the flexor carpi ulnaris; the former muscle being situated on its radial or outer, the latter on its ulnar or inner side.

Q. What nerve is situated near the artery?

A. The ulnar. It runs along the ulnar or inner side of the artery, inclining a little to its anconal or posterior aspect.

Q. Describe the method of tying the ulnar artery at the wrist?

A. The operator should commence his incision half an inch above the os pisiforme, and continue it upwards, along the radial or outer margin of the flexor carpi ulnaris, to the extent of three inches. The artery is found immediately under the fascia, in the situation above described.

The Radial Artery.

Q. Describe the situation of the radial artery, at the upper third of the fore-arm?

A. The artery at this part has the supinator radii longus on its outer, and the flexor carpi radialis on its inner side, and is covered by the ulnar margin of the former muscle; the pronator radii teres, which it crosses, and the flexor digitorum sublimis, and flexor longus pollicis, lie immediately behind it. The superficial branch of the spiral nerve, runs on its radial or outer side.

Q. Describe the usual method of tying the radial artery, at the upper third of the fore-arm?

A. The surgeon should begin his incision just below the insertion of the tendon of the biceps flexor cubiti, and extend it obliquely downwards and outwards, for three inches, exactly in the interspace, between the supinator radii longus and flexor carpi radialis. After the integuments and fascia are divided, the ulnar or inner edge of the long supinator should be raised, and drawn a little outwards; this will expose the artery, which must be carefully separated from its accompanying veins and nerve, before the ligature is applied.

Q. Describe the situation of the radial artery at the wrist?

A. The vessel at this part of the fore-arm is covered merely by the skin and fascia, and runs on the radial or outer side of the flexor carpi radialis muscle, and close to the thenal or anterior aspect of the radius.

Q. Is any nerve situated near the artery?

A. Yes; a twig of the musculo-cutaneus or perforans casserii. It is not included in the same sheath with the artery, but runs between the integuments and fascia.

Q. Describe the method of tying the radial artery at the wrist?

A. The first incision should commence at the styloid process of the radius, and be continued upwards, towards the elbow, for two inches along the outer side of the flexor carpi radialis. Its upper extremity will pass a short way on the ulnar or inner margin of the tendon of the supinator radii longus; as soon as the integuments are divided, the operator should carefully lay open the subjacent fascia, immediately beneath which the artery is found.

Internal Iliac Artery.

Q. Describe the situation of the internal iliac artery?

A. This large vessel descends behind the peritonæum, along the edge of the sacrum, into the pelvis. The internal iliac vein is situated on its lateral or outer aspect.

Q. Describe the operation of tying the internal iliac artery?

A. An incision five inches in length should be made through the integuments and superficial fascia, on the anterior and lateral part of the abdomen, parallel with, and half an inch on the iliac or outer side of the epigastric artery. This exposes the tendon of the external oblique muscle, which should next be divided in the direction of the outer wound. The operator then passing his finger beneath the inferior border of the internal oblique and transversalis muscles, slits them both up with a probe-pointed bistoury; he next separates the peritonæum from the surface of the iliacus internus and psoas magnus, and pushing it towards the mesial line, feels the artery in the situation above mentioned.

External Iliac Artery.

Q. Describe the situation of the external iliac artery?

A. The external iliac artery, passes down behind the peritonæum, along the mesial or inner border of the psoas magnus. The external iliac vein lies close to its mesial or inner aspect. The crural nerve is situated on its lateral or outer aspect, and separated from it by the psoas muscle.

Q. Describe the operation of tying the external iliac artery?

A. A semilunar incision, three or four inches in length, should be made through the integuments and fascia, at the lower and lateral part of the abdomen; it should commence a short way below, and on the mesial side of the superior anterior spinous process of the os ilium, and be continued a little above, and in the direction of Poupart's ligament, so as finally to terminate at the upper part of the inner pillar of the external abdominal ring; this lays bare the tendon of the obliquus externus muscle, which should next be divided throughout the extent of the first incision.

The flap thus formed, being reflected, brings into view the inferior margins of the obliquus internus and transversalis, which are to be turned up with the handle of the knife; the surgeon then passing his finger behind the spermatic cord, pushes aside the peritonæum, on the dorsal aspect of which, the artery is situated, in the manner already described.

Femoral Artery.

Q. Describe the situation of the femoral artery at the groin?

A. The artery at this point is covered by the skin, fascia superficialis, inguinal glands, fascia lata, and adipose membrane; and rests upon the rotular or anterior surface of the common termination of the psoas magnus and iliac internus muscles; it has the sartorius and rectus femoris, on its outer, and the pectinalis and triceps adductor, on its inner side; the femoral vein passes along its tibial or inner, and the anterior crural nerve on its fibular or outer aspect.

Q. Describe the method of laying bare the femoral artery at the groin?

A. The incision should begin a little below the middle of Poupart's ligament, and be carried obliquely downwards for about three inches; the artery is found beneath the fascia in the situation above mentioned.

Q. Describe the situation of the femoral artery at the middle of the thigh?

A. The artery at this part of the thigh is invested in a strong sheath of condensed cellular membrane, and covered by the common integuments, fascia and sartorius muscle; it runs over the pectinalis, part of the adductor brevis, the whole of the adductor magnus, and a small portion of the adductor longus, and seems lodged in a groove formed by the insertion of these muscles, and the origin of the vastus internus, which lies on its fibular or outer aspect. The femoral vein is situated on its inner and posterior side; on its outer and anterior aspect, is the saphena nerve, a branch of the anterior crural.

Q. Describe the operation of tying the femoral artery at the middle of the thigh ?

A. The patient must be laid in the horizontal position, with his knee half bent, and his toes turned outwards ; the surgeon then divides the skin and cellular membrane a little above the middle of the thigh, commencing his incision two inches below Poupart's ligament, and continuing it obliquely downwards in the direction of the sartorius muscle for about three inches ; having cut through the integuments, he next opens, in the middle of the external wound, the subjacent fascia lata, to the extent of an inch and a half ; this exposes the sartorius, the inner edge of which must be reflected outwards, when the sheath of the femoral artery presents itself, and requires to be carefully opened before the ligature is applied.

Popliteal Artery.

Q. Describe the situation of the popliteal artery ?

A. This vessel has the condyles of the os femoris, and the heads of the gastrocnemius externus on each side of it ; it rests upon the capsular ligament of the knee joint, and the popliteus muscle ; and, is covered by tendinous fascia, the popliteal nerve and vein, and by adipose membrane.

Q. Describe the method of tying the popliteal artery?

A. An incision three inches in length, should be made between the condyles of the os femoris ; as soon as the integuments and fascia are divided, the popliteal nerve presents itself, the popliteal vein next appears, beneath which is the artery, imbedded in a quantity of adipose substance.

Anterior Tibial Artery.

Q. Describe the situation of the anterior tibial artery a little above the middle of the leg ?

A. The artery at this place runs down on the rotular or anterior surface of the interosseous ligament, between the tibialis anticus and extensor longus digitorum, the former muscle being situated on its tibial or inner, and the latter on its fibular or outer side.

Q. Describe the operation of tying the anterior tibial artery, a little above the middle of the leg ?

A. The incision should begin a short way above the middle of the leg, and be continued downwards, a finger's breadth on the fibular or outer side of the spine of the tibia for three or four inches ; after the integuments and fascia are divided, the tibialis anticus and extensor longus digitorum should be separated from each other ; between these two muscles, at the depth of an inch, the artery is found.

Q. Describe the method of tying the anterior tibial artery, just after it appears on the interosseous ligament ?

A. The surgeon should commence his incision an inch below the head of the fibula, and continue it downwards along the tibial or inner edge of this bone, for about four inches ; after having cut through the skin and fascia, he should then separate the peroneus longus and the extensor communis digitorum muscles from each other, deep between which, on the interosseous ligament, the artery is situated.

Posterior Tibial Artery.

Q. Describe the situation of the posterior tibial artery, at the upper part of the leg ?

A. The artery at this part runs between the two heads of the soleus, and rests upon the proximal or upper part of the tibialis posticus ; it is covered by a strong aponeurosis, and by the plantaris, and gastrocnemius muscles, and has the posterior tibial nerve behind it; in other words, the posterior tibial artery has the outer and larger origin of the soleus on its fibular, and the smaller origin of the same muscle, on its tibial side; the tibialis posticus, lies on its rotular or anterior aspect; and the aponeurosis of the leg, the plantaris and gastrocnemius externus, are situated on its popliteal or posterior aspect.

Q. Describe the method of tying the posterior tibial artery, at the upper part of the leg?

A. The first incision should commence a little below the condyles of the os femoris, and be continued downwards, exactly in the middle of the calf of the leg, for about three inches; as soon as the skin, fascia, and gastrocnemius externus are divided, the plantaris muscle, which next presents itself, should be raised, and reflected tibiad or inwards. An incision is then to be made along the inner edge of the outer origin of the soleus, through the aponeurosis, immediately beneath which, the artery is situated.

Q. Describe the situation of the posterior tibial artery, below the middle of the leg?

A. The artery here lies under the soleus muscle, covered by the thick aponeurosis which separates the superficial, from the deep-seated muscles of the leg; it rests upon the popliteal or posterior surface of the bellies of the tibialis posticus and extensor longus digitorum; and has the posterior tibial nerve on its fibular aspect, and a vein on each side.

Q. Describe the method of tying the posterior tibial artery below the middle of the leg?

A. The surgeon should begin his first incision a little below the middle of the leg, and carry it obliquely downwards for three or four inches along the tibial or inner edge of the gastrocnemius externus; this muscle should then be raised, and reflected fibulad or outwards, in order to expose the soleus, the fibres of which are next to be divided; this brings into view the strong aponeurosis or membranous fascia, immediately beneath which, the artery is found invested in a sheath of cellular tissue.

Q. Describe the situation of the posterior tibial artery at the ancle?

A. The vessel here is lodged in the sinuosity of the os calcis, between the tendo achillis and malleolus internus; it is covered by the common integuments and tendinous fascia, and has a vein on each side; the posterior tibial nerve runs behind it; the tendons of the tibialis posticus and flexor longus digitorum, are situated on its rotular or anterior aspect; and the flexor longus pollicis, passes down on its popliteal or posterior aspect.

Q. Describe the method of tying the posterior tibial artery, at the ancle?

A. The vessel is so superficially situated, that it is readily exposed. The first incision should be made somewhat nearer the malleolus internus, than the tuberosity of the os calcis.

DISEASES OF THE VEINS.

Q. What are the diseases of the veins?

A. Inflammation, varix, scirrhus, and ossification. The two last are very rare.

Phlebitis.

Q. What symptoms are indicative of phlebitis or inflammation of a vein?

A. A red streak appears on the integuments, in the course of the inflamed vessel, and the surrounding parts become swollen and painful. The patient at the same time is affected with severe constitutional irritation.

Q. What are the causes of phlebitis?

A. Punctures, the application of ligatures, &c.

Q. How does phlebitis terminate?

A. If slight, it terminates in an effusion of coagulable lymph, and consequent adhesion of the opposite sides of the vein; if violent, it terminates in suppuration. Sometimes it extends along the internal membrane of the vessel into the cavity of the heart.

Q. How is phlebitis to be subdued?

A. The general remedies consist of purgatives, antimonials, diaphoretics, and diluents; the local remedies are leeches, warm fomentations, and saturnine lotions.

Q. By what means can the inflammation be prevented spreading to the heart?

A. By the application of a firm compress to the vein, a short distance above the wounded part. The pressure causes adhesion of the sides of the vessel, whereby, the extension of the inflammation is obstructed.

Q. If the vein has suppurated, what should be done?

A. The vessel should be divided, that the purulent matter may be discharged and prevented mixing with the blood.

Varix.

Q. What is understood by varix?

A. Varix is a small, soft, dark-coloured, unequal swelling; caused by a preternatural dilatation and thickening of the coats of a vein.

Q. What changes do the veins undergo when they become varicose?

A. Their caliber is not only enlarged, and their coats thickened, but, they become lengthened, tortuous, and knotty; the blood circulates through them very slowly, and sometimes, even coagulates within them. Varices occasionally burst, and an extravasation of blood takes place, and when situated in the extremities, they are frequently attended with pain, œdema, and numbness of the affected limb.

Q. Do varices occur in every part of the venous system?

A. Yes; but more frequently in the superficial, than in the deep-seated veins; they occur oftener in the veins of the extremities, than in those of the trunk;

and, in the veins of the inferior, than in those of the superior extremities.

Q. What particular veins are very subject to varix ?

A. The venæ saphenæ, the spermatic, and the hæmorrhoidal veins.

Q. What is the cause of varix ?

A. Pressure, obstructing the venous circulation, violent sprains, spasms, &c. The complaint sometimes appears spontaneously.

Q. How is a varicose state of the veins to be treated ?

A. Moderate and continued pressure, where this can be properly applied ; rest, and the use of cold lotions, afford the most effectual relief. In some cases, the diseased veins require to be cut out or divided.

Q. Describe the method of dividing a varicose vein ?

A. Introduce a small bistoury, having a convex cutting edge, flat between the integuments and the vein ; then turn the edge of the instrument backwards, and cut the vein completely across. The hæmorrhage which succeeds the division of the vessel, should be checked by compress and bandage.

BLEEDING.

Q. On what veins is venesection usually performed ?

A. On the veins at the bend of the arm ; on the vena saphena major ; and on the external jugular vein.

Q. What are the veins at the bend of the arm called ?

A. The basilic, the cephalic, the median, the median-basilic, and the median-cephalic. Of these the median-basilic is the largest.

Q. What artery lies under the median-basilic vein ?

A. The brachial artery.

Q. What ill consequences sometimes result from bleeding at the arm ?

A. Ecchymosis; inflammation of the skin and cellular membrane ; inflammation of the fascia and absorbents ; inflammation of the vein ; wound of a nerve ; wound of the brachial artery.

Q. Describe the usual manner of opening the external jugular vein?

A. The patient being seated in a chair, with his head reclining backwards, and his face turned towards the opposite side, the surgeon compresses the vein with the thumb of his left hand against the edge of the mastoid muscle; he then takes the lancet in his right hand, and as soon as the vessel appears sufficiently distended, he punctures it in the direction of the fibres of the platysma myoides, a short distance above the point of compression. When a sufficient quantity of blood has been taken away, the wound should be closed by a strip of adhesive plaster.

Q. On what artery is the operation of arteriotomy performed?

A. On the temporal artery.

Q. Describe the course of the temporal artery?

A. The trunk of the temporal artery, which is the continuation of the external carotid, runs between the meatus auditorius externus, and root of the zygomatic process; after giving off several branches to the face and parotid gland, it divides nearly opposite the outer angle of the eye, into two branches, the anterior and posterior; the former runs along the upper and lateral part of the fore-head; the latter passes obliquely upwards and backwards towards the occiput.

Q. Is the temporal artery situated beneath the fascia?

A. No; it runs on the peripheral or outer surface of the aponeurosis of the temporal muscle, and is covered only by the common integuments.

DISEASES OF THE BONES.

Q. What diseases are the bones subject to?

A. Inflammation; caries; necrosis; exostosis; osteosarcoma; spina ventosa; rachitis; mollities; and fragilitas. Bones may be cut, contused, or broken.

Caries.

Q. What is meant by caries?

A. Caries is ulceration of the bones. Caries of a bone, and ulceration of the soft parts, bear a strong analogy to each other; the difference, indeed, between these two diseases, is considered, to arise merely from the different structure of the parts in which they exist.

Q. By what indications is the existence of caries to be ascertained?

A. In the commencement of the disease, an obtuse deep-seated pain is felt in the affected limb, and the superincumbent integuments are discoloured, tender and flabby to the touch; the soft parts at length ulcerate, and a sinus is formed, which runs down to the caries, and discharges a dark-coloured, offensive, ichorous matter. The diseased portion of bone itself is generally soft, moist, and perforated with numerous holes, from which spongy granulations arise; sometimes it is dry and of a pale white colour.

Q. Are all the bones susceptible of being affected by caries?

A. Yes.

Q. In which does it most commonly occur?

A. In those of a spongy texture, viz. the sternum, vertebræ, bones of the carpus and tarsus, and the extremities of the long bones.

Q. What are the causes of caries?

A. The local causes, are, local inflammation of the bones, violent contusions, and the pressure of tumours; the general or constitutional causes, are, syphilis, scrofula, and scurvy.

Q. Which bones most frequently become carious from syphilis?

A. The tibia, the bones of the cranium, the sternum, the palate, and the nasal bones.

Q. Which from scurvy?

A. The tibia and the maxilla inferior.

Q. Which from scrofula ?

A. The vertebræ, the bones of the carpus and the tarsus, and the extremities of the long bones.

Q. Whether is caries arising from a constitutional, or a local cause, most difficult of cure ?

A. Caries from a constitutional cause. Caries from scrofula is more difficult of cure, than that arising from scurvy, or syphilis ; and caries of the spongy bones, is more dangerous and difficult of removal, than that of compact ones.

Q. When is caries attended with the greatest danger ?

A. When it exists in the bones of the cranium, in the vertebræ, in the bones of the carpus and the tarsus, and in the large joints.

Q. How is caries to be treated ?

A. In some cases, the complaint may be checked, and the absorption, or exfoliation of the diseased portion of the bone effected, by means of blisters and caustic issues. In others, the carious part requires to be exposed, and then cut away by a trephine, circular saw, or chisel. When caries arises from syphilis, mercury should be administered ; when from scurvy, vegetable diet and citric acid. In scrofulous caries, aperients, tonics, country air, and nutritious food, ought to be prescribed.

Q. In what cases of caries is amputation required ?

A. In extensive caries of the large joints, accompanied with hectic symptoms.

Necrosis.

Q. What is understood by necrosis ?

A. When a portion of bone is deprived of its vitality, and then becomes detached from the living parts, necrosis is said to have taken place.

Q. Explain in what manner necrosis is commonly produced ?

A. From some cause or other the periosteum violently inflames ; it then suppurates and this suppuration causes it to separate from the bone; the bone now, in consequence of its nutritious arteries being destroyed, soon perishes; the dead portion is then thrown off from the living parts, and, after a longer or shorter period, is either absorbed, or discharged externally at the surface.

Q. Explain how the process is carried on, when necrosis arises from a morbid affection of the membrana medullaris?

A. When the medullary membrane is diseased, the bone lacks nourishment and dies; it then acts as a foreign body, and causes the periosteum to inflame, suppurate, and ultimately to separate from its surface. The living bone at length throws off the dead part, which is either removed by the absorbents, or escapes through fistulous openings formed in the superincumbent integuments.

Q. What takes place as soon as the periosteum is detached from the bone?

A. The membrane soon resumes its healthy action, granulations spring up from its internal surface, and a new bone, which at first consists of a mere osseous shell, is in a short time produced.

Q. Does the new bone incase the original one?

A. Yes; but openings form in various parts of it, to allow the sequestra to escape.

Q. What is meant by the sequestra?

A. Sequestra is a name given to the dead portions of bone in necrosis.

Q. What changes does the new bone undergo?

A. As the old bone disappears, the new one proportionably increases in thickness; at last it becomes perfectly solid, and for a short time remains in this state; it then begins to be cancellated in its central part, and eventually acquires the appearance and structure of the original one.

Q. Does the diseased limb remain of its former length?

A. Yes; because the old bone, although separated from the periosteum, never relinquishes its attachment to the epiphyses, until the new bone has acquired sufficient strength and solidity to support the action of the muscles inserted into it.

Q. Which part of the long bones is generally the seat of necrosis ?

A. The diaphysis or shaft of the bone. The epiphyses, or articulating ends of the bone, on account of their great vascularity, and their receiving nutritious vessels from other sources than the periosteum, are seldom affected with the disease.

Q. Are all the bones liable to necrosis ?

A. Yes; but the tibia, femur, clavicle, humerus, maxilla inferior, radius, and ulna, are those which it most commonly attacks.

Q. Are all the bones regenerated after being necrosed ?

A. Yes; all are regenerated, excepting those of the cranium, and those of the carpus and the tarsus.

Q. What circumstances impede the process of regeneration ?

A. Old age, pregnancy, lues venerea, cancer and rickets.

Q. How is necrosis to be treated ?

A. As soon as the inflammation which attends the disease is subdued by suitable antiphlogistic remedies, blisters should be applied to promote the absorption of the sequestra. If these present at the fistulous openings, and are loose, they must be removed ; if they be firmly fixed, they should be allowed to remain a short time longer, unless they produce violent constitutional irritation ; in this case, they ought to be exposed, and cut away by means of trephines, saws, chisels, &c. When necrosis is very extensive, and the patient's strength is exhausted by the pain, profuse discharge and hectic fever, the affected limb must be amputated.

Exostosis.

Q. What is understood by exostosis?

A. Exostosis is a hard tumour consisting of osseous matter, and generally growing from a bone or the periosteum.

Q. Into how many kinds has exostosis been divided?

A. Into four, viz. the fungous and the cartilaginous; the periosteal and the medullary.

Q. Which bones are most subject to exostosis?

A. The femur, the tibia, the bones of the cranium, the maxilla inferior, the sternum, the humerus, the radius, the ulna, and bones of the carpus.

Q. What are the causes of exostosis?

A. The local causes are external injuries; the general ones are scrofula, lues, and scurvy.

Q. Which is the most dangerous kind of exostosis?

A. The fungous medullary kind. It is of a very malignant character, and in some particulars, bears a resemblance to fungus hæmatodes. Amputation affords the only means of removing it.

Q. Which are the next most dangerous kinds of exostosis?

A. The cartilaginous medullary and the fungous periosteal. These in their early stage should be laid bare and extirpated by means of saws, &c.; if left to run their course, they generally produce such extensive disease, that nothing but amputation can give relief.

Q. Which is the least formidable species of exostosis?

A. The cartilaginous periosteal. It is extremely hard, and slow in its growth; when small and recent, it may be dispersed by the use of repeated blisters; when large and in the advanced state, it requires to be cut away. Venereal nodes are a kind of periosteal exostosis.

Q. Which bones do venereal nodes chiefly affect?

A. Those of the cranium, the tibia, the clavicle, and all such as are thinly covered with soft parts.

Osteosarcoma.

Q. What is osteosarcoma ?

A. Osteosarcoma is the conversion of bone into a substance very similar in appearance and consistency to lard or fat.

Q. What bones are most subject to this disease ?

A. The bones of the base of the cranium, the bones of the face, the ossa innominata, and the long bones of the extremities.

Q. How is osteosarcoma to be treated ?

A. Amputation is the sole remedy; and even this is not always attended with a favourable result.

Rachitis.

Q. What are the symptoms of rachitis ?

A. The head is preternaturally large, the sternum prominent, and the abdomen tumid; the ribs are depressed, the epiphyses swollen, and the bones and vertebral column distorted ; the muscles are flaccid, and the urine deposits a calcareous sediment. These symptoms are accompanied with low fever, disorder of the bowels, cough, difficult respiration, and sallowness of the countenance.

Q. At what age does rachitis generally appear ?

A. Seldom more early than nine months, or later than two years, after birth.

Q. What is the proximate cause of rachitis ?

A. A deficiency of phosphate of lime in the bones.

Q. What are its remote causes ?

A. Impure air, indigestible food, want of cleanliness, &c.

Q. How is it to be treated ?

A. The best remedies are nutritious diet, cleanliness, aperients, tonics, phosphate of lime, cold bathing, and friction to the skin.

Mollities.

Q. What are the characters of this disease?

A. In mollities, the bones are so soft and flexible, that they can be bent in any direction. The disease is attended with no pain. It most commonly occurs in adult age, and attacks women more frequently than men.

Q. What is the proximate cause of mollities ossium?

A. The same as that of rachitis.

Q. What treatment does mollities require?

A. The patient should be recommended to rest on a firm matrass, and to persevere in the use of tonic medicines. The complaint is generally incurable.

Fragilitas.

Q. What are the symptoms of fragilitas?

A. In this peculiar affection, the bones are so exceedingly brittle, that they are fractured by the slightest injuries, or by the action of the muscles alone.

Q. What is the proximate cause of fragilitas?

A. A deficient quantity of gelatin, or a preternatural accumulation of osseous matter in the bones; its remote causes are, old age, lues, cancer, and scurvy. The treatment consists in the liberal use of tonics, or, in some cases, of mineral acids.

FRACTURES.

Q. How are fractures divided?

A. From the direction in which they extend, they are divided into transverse, oblique, and longitudinal; they are also divided into simple, compound, complicated, and comminuted.

Q. What is understood by simple fracture?

A. When there exists a solution in the continuity of a bone, unaccompanied with any wound of the soft parts, caused by the protrusion of the extremities of the fragments, the case is denominated a simple fracture.

Q. What is signified by compound fracture?

A. A fracture is termed compound, when the bone is not only divided, but the extremity of one, or both fragments protrudes through the integuments, causing an external wound.

Q. What is understood by complicated, and by comminuted fracture?

A. Fracture is termed complicated, when it is attended with a wound of a large artery; with extensive laceration of the soft parts, or with dislocation of a joint; and comminuted, when the bone is divided into several pieces.

Q. What are the principal causes of fracture?

A. External injuries, and the violent action of the muscles.

Q. What are the symptoms of fracture?

A. Pain, swelling, deformity, and sometimes, shortening of the limb; loss of motion, and crepitus on rubbing the broken pieces of bone together.

Q. When is the prognosis of fracture unfavourable?

A. When the fracture extends into, or is situated near a joint; when it is accompanied with severe contusion, or laceration of the soft parts, or with a wound of a large artery; when it is compound; and when it occurs in an aged, or debilitated person.

Q. In what fractures are the two fragments most displaced?

A. In oblique fractures. In transverse ones, the ends of the broken bone generally remain more or less in contact, and the limb is not shortened; but, in oblique fractures, they slide past each other, and the length of the limb is diminished.

Q. Which fragment is commonly the most displaced?

A. The distal or inferior one. The proximal or upper fragment, usually remains, but little removed from its natural situation.

Q. By what causes is the displacement of the fragments produced?

A. By the action of the muscles inserted into them, by the weight of the limb, by the violence which caused the fracture, and by the weight of the body.

Q. How is simple fracture to be treated ?

A. The limb should be placed in such a position as will most effectually relax the principal muscles attached to the fractured bone ; it should then be gradually extended, so that the extremities of the upper and lower fragments may be brought into accurate apposition ; this being accomplished, splints and bandages should be applied to prevent the fragments again becoming displaced, and proper measures at the same time adopted, to reduce the inflammation.

Q. What practice should be pursued in fracture, complicated with a wounded artery, or a dislocated joint ?

A. Before the fracture is set, the artery should be tied, and the luxation reduced.

Q. How is compound fracture to be treated ?

A. If the case be not such as to require immediate amputation, the protruded extremities of the fractured bone should be restored to their natural situation as speedily as possible ; the surgeon should then place them in coaptation, lay the limb in splints, apply proper bandages, endeavour to heal the external wound by the first intention, and to subdue the inflammation by antiphlogistic remedies.

Q. How is the replacement of the protruded bone in compound fracture, to be effected ?

A. The limb should be bent, and the muscles put into a state of relaxation ; extension and counter-extension should then be made, in that direction, in which the wound appears to be most dilated.

Q. What should be done, if the protruded end of the bone cannot be reduced by this method ?

A. Under these circumstances, the wound should be enlarged by a scalpel, or a portion of the protruded bone sawed off.

Q. Which is the preferable plan ?

A. To enlarge the wound. In some cases, however, as for example, in very oblique compound fractures of the tibia, it is most adviseable to remove a part of the exposed bone.

Q. Which fragment is generally protruded?

A. The proximal or upper one.

Q. In which bones does compound fracture most frequently occur?

A. In the tibia and femur.

Q. What causes prevent the reunion of fractures?

A. Constant motion of the limb, old age, pregnancy, debility, scurvy, &c.

Q. What is the result of fractures not reuniting?

A. The formation of false joints.

Q. In which bones do false joints most usually appear?

A. In the humerus and femur.

Q. How are they to be remedied?

A. By rubbing the ends of the fragments together; by cutting them away; or by passing a seton betwixt them. The last is the most successful method of treatment.

Fracture of the Ossa Nasi.

Q. How is fracture of the ossa nasi to be treated?

A. The depressed and fractured bones are to be raised up, and replaced in their natural situation, and the inflammation subdued by proper antiphlogistics. This accident is generally attended with severe contusion of the soft parts, and sometimes, with concussion of the brain.

Fracture of the Maxilla Inferior.

Q. At which part is the lower jaw generally fractured?

A. Between the symphysis menti and insertion of the masseter muscle. The case is easily detected by the inequality of the bone, the pain and crepitus.

Q. By what muscles are the fragments displaced?

A. The side of the bone is drawn upwards by the masseter; while the mylo-hyoidei, genio-hyoidei, genio-hyo-glossi, and digastrici, draw the chin downwards.

Q. In what manner is fracture of the lower jaw to be treated ?

A. The ends of the fragments should be placed in accurate coaptation, a paste-board splint dipped in glue applied along the outer side of the jaw, a piece of cork of a semilunar form put between the teeth, and the chin supported by a compress and bandage. During the cure, the patient must live on milk, panada, and soups.

Fracture of the Sternum.

Q. What symptoms attend fracture of the sternum ?

A. Pain, crepitus, difficulty of breathing, cough, bloody expectoration, and sometimes emphysema ; the soft parts are generally much contused, and in some cases, the accident is succeeded by empyema or necrosis.

Q. Describe the method of treating fracture of the sternum ?

A. After the loose splinters of the bone, if there be any, are removed, a broad bandage should be applied round the chest ; the patient should then be bled, and antimonials and other antiphlogistics administered, to prevent inflammation.

Q. What are the symptoms of fracture of the ribs ?

A. Fractures of the ribs are generally attended with the same symptoms as fracture of the sternum, and require similar treatment.

Fracture of the Clavicle.

Q. By what symptoms is fracture of the clavicle ascertained ?

A. By the pain, the inability of raising the arm, the crepitus, the shoulder of the injured side falling forward towards the sternum, and by the ends of the fragments being distinctly felt.

Q. Which portion of the fractured clavicle remains in its natural situation?

A. The sternal portion. The acromial part is brought downwards and forwards by the weight of the arm, and by the action of the deltoides, the pectorales major and minor, the subclavius, and the serratus magnus muscles.

Q. In what manner is fracture of the clavicle to be reduced?

A. A soft cushion should be placed in the axilla, the shoulders drawn upwards, outwards, and backwards, and retained in this position by means of a broad bandage. The fore-arm should be bent and supported in a sling.

Fracture of the Humerus.

Q. At what part is the humerus usually broken?

A. At its middle part. It is also, sometimes, fractured at its anatomical, or at its surgical neck, and sometimes, a little below the insertion of the deltoid muscle. The condyles of the humerus are occasionally broken off obliquely from the shaft of the bone.

Q. Which is the anatomical, and which the surgical neck of the humerus?

A. The anatomical neck is a rough depression situated between the round head and tubercles of the humerus, and gives attachment to the capsular ligament; the surgical neck lies between the tubercles and the insertion of the pectoralis major, latissimus dorsi, and teres major muscles.

Q. By what symptoms is fracture of the humerus detected?

A. By the pain, crepitus, and difficulty of moving the arm; by the distortion of the limb, and the mobility of its distal or inferior part.

Q. How is fracture of the anatomical neck to be distinguished from dislocation of the humerus?

A. By the crepitation, by the head of the humerus not being felt in the axilla, and by its remaining immoveable while the surgeon rotates the diaphysis or shaft of the bone.

Q. When is fracture of the humerus attended with the greatest displacement ?

A. When it occurs towards the proximal or upper extremity of the bone, because it is generally oblique at this part. When the humerus is broken at the distal or inferior extremity, the fracture is commonly transverse, and on this account, the displacement of the fragments is very inconsiderable.

Q. By what muscles is the lower fragment displaced when the humerus is broken at its anatomical neck ?

A. The supra-spinatus, the infra-spinatus, and the teres minor draw it upwards, and somewhat outwards ; the subscapularis, the pectoralis major, latissimus dorsi and teres major, draw it upwards and inwards ; and the deltoides, biceps, long portion of the triceps, and the coraco-brachialis draw it directly upwards.

Q. By what muscles is the inferior fragment displaced, when fracture occurs at the surgical neck of the humerus ?

A. The pectoralis major, latissimus dorsi, and teres major draw it upwards and inwards ; and the deltoides, biceps, long head of the triceps, and the coraco-brachialis draw it upwards.

Q. Is the upper fragment at all displaced in fracture of the surgical neck of the humerus ?

A. Yes; it is drawn outwards by the supra-spinatus, the infra-spinatus, and the teres minor muscles.

Q. By what muscles is the inferior fragment displaced, when the humerus is broken obliquely, just above the insertion of the deltoides ?

A. It is drawn upwards and outwards by the deltoides, and upwards by the biceps, coraco-brachialis, and the three heads of the triceps.

Q. By what muscles would the lower fragment be displaced, if an oblique fracture of the humerus were to take place below the insertion of the deltoid muscle ?

A. It would be drawn upwards by the biceps, the three heads of the triceps, the coraco-brachialis, and the brachialis internus.

Q. Describe the method of reducing fracture of the humerus ?

A. The elbow should be bent, and the extremities of the fragments placed in coaptation by means of extension and counter-extension ; two splints should then be applied to the limb, one on its radial or outer, and the other on its ulnar or inner side ; these splints should extend from the shoulder to the elbow-joint, and be retained in their proper situation by broad tapes ; during the cure, the fore-arm should be kept in a state of flexion, and suspended in a sling.

Q. When one of the condyles of the humerus is broken off, what should be done ?

A. The fragment should be replaced, the elbow half bent, two lateral splints applied, and the fore-arm supported in a sling.

Fracture of the Bones of the Fore-Arm.

Q. At what points are the bones of the fore-arm commonly fractured ?

A. At their middle part, and inferior extremity.

Q. What are the symptoms of fracture of the bones of the fore-arm ?

A. Pain, deformity of the limb, crepitus, and inability of performing pronation and supination.

Q. In what direction are the fragments displaced ?

A. In a transverse direction, that is, the radius is drawn towards the ulna, and the ulna towards the radius.

Q. Is the limb in any degree shortened ?

A. Seldom or never. A longitudinal displacement of the fragments, however obliquely the bones may be broken, cannot, in consequence of the peculiar attachments of the muscles and interosseous ligament, take place, except it be produced by the violence which caused the fracture.

Q. What muscles occasion the transverse displacement ?

A. The pronator muscles, which are, the pronator radii teres, the pronator radii quadratus, the palmaris longus, the flexor carpi radialis, and the flexor digitorum sublimis.

Q. In what manner is fracture of the bones of the fore-arm to be reduced ?

A. The fore-arm must be bent, and the hand held in a position between pronation and supination ; extension and counter-extension should then be made to bring the ends of the fragments into accurate contact ; this being effected, two splints should be applied to the limb, one along its thenal or anterior, and the other along its anconal or posterior surface ; these splints should extend from the elbow to the second joint of the fingers ; they should be well padded, to preserve the interosseous space, and secured by a bandage.

Q. Whether is the radius, or ulna most frequently broken ?

A. The radius. Fracture of the radius is for the most part easily ascertained ; the fragments are displaced in a transverse direction, and drawn towards the ulna by the pronator muscles. The accident requires the same treatment as when both the bones of the fore-arm are fractured.

Q. At what part is the ulna generally fractured ?

A. At its inferior and smaller extremity. The injury should be treated like fracture of the radius.

Q. Is the lower fragment at all displaced ?

A. Yes ; it is drawn towards the radius by the pronator radii quadratus muscle.

Fracture of the Olecranon.

Q. In what direction is the olecranon commonly fractured ?

A. In a transverse direction.

Q. What symptoms attend fracture of the olecranon ?

A. The fore-arm is kept in a half bent position by the flexor muscles, and cannot be extended; an interspace is distinctly felt between the two fragments, one of which is drawn up at the back of the humerus.

Q. How is fracture of the olecranon to be treated?

A. The fore-arm should be extended, the retracted olecranon brought down towards the ulna, and preserved in coaptation with it by means of a bandage. A splint should be applied along the thenal surface of the limb, to prevent flexion of the elbow joint.

Fracture of the Femur.

Q. At what part is the femur generally fractured?

A. At its middle part. The fracture is always oblique when it occurs at the middle and upper part of the bone; and transverse, when it takes place at its distal or inferior extremity.

Q. What are the symptoms of fracture of the femur?

A. Pain, deformity and shortening of the limb, loss of motion, crepitus, and eversion of the foot.

Q. What muscles shorten the limb when the femur is broken at its middle part?

A. The sartorius, the rectus femoris, the cruralis, the vasti, the tricipites longus and magnus, the gracilis, the biceps, the semitendinosus, and the semimembranosus. The turning out of the foot is produced by the action of the tricipites longus and magnus.

Q. In what manner is fracture of the femur to be reduced?

A. The patient must be laid upon his back, and the thigh and knee fixed in a half bent position, so as to relax the muscles. Extension should then be made, and the ends of the fractured bone brought in contact; this done a long splint passing beyond the hip and knee joints should be applied to each side of the thigh, and the limb placed in a double inclined plane.

Q. In what direction is the neck of the femur commonly broken?

A. In a transverse direction. The fracture, however, is sometimes oblique, and may occur either within or without the capsular ligament.

Q. What are the symptoms of fracture of the neck of the femur.

A. The limb is shortened and distorted; when extension is made, a crepitus is distinctly heard, the knee is bent, and the toes are turned fibulad or outwards, a swelling appears a little below the groin, the trochanter major is not observable, the patient experiences severe pain, especially during abduction, or rotation of the thigh, and for the most part is incapable of standing.

Q. What muscles shorten the limb when the femur is broken at its cervix?

A. The sartorius, tensor vaginæ femoris, rectus femoris, triceps adductor, pectinalis, gracilis, biceps, semitendinosus, semimembranosus, psoas magnus, iliacus internus, and the three glutæi muscles.

Q. To what cause is the turning out of the knee and toes to be ascribed?

A. To the action of the muscles which rotate the thigh outwards.

Q. By what muscles is the thigh rotated fibulad or outwards?

A. By the pyriformis, gemini, obturatores, quadratus, psoas magnus, iliacus internus, glutæus minim: and triceps: in certain circumstances these are assisted by the glutæi max: and med: and tensor vaginæ femoris.

Q. Is fracture of the neck of the femur reunited by callus?

A. When the fracture is situated on the outside of the capsular ligament, a bony reunion of the pieces undoubtedly takes place; but when it occurs within the capsular ligament, the fragments are never reunited by bone, but by ligamentous bands.

Q. How is fracture of the neck of the femur to be treated?

A. In the same manner as fracture of the middle part of the femur.

Fracture of the Patella.

Q. In what direction is the patella generally fractured ?

A. In a transverse direction, The accident is usually attended with laceration of the tendinous expansion covering the rotular or anterior surface of the patella.

Q. What is the most frequent cause of transverse fracture of the patella ?

A. The action of the extensor muscles of the leg. It is sometimes produced by violent blows, &c.

Q. Which are the extensor muscles of the leg ?

A. The rectus femoris, the cruralis, the vastus internus, and the vastus externus. They are all inserted into the knee-pan.

Q. What are the symptoms of transverse fracture of the patella ?

A. Pain and total inability of extending the leg. Between the two fragments at the same time appears a considerable interspace, which is increased by flexion, but diminished by a contrary motion of the knee.

Q. Is transverse fracture of the patella reunited by callus ?

A. Very rarely. From the difficulty of keeping the surfaces of the fragments in contact, the reunion is generally effected by ligamentous matter.

Q. How is transverse fracture of the patella to be treated ?

A. The patient must be placed in a sitting posture, and the leg extended and laid upon a broad splint ; the fragments should then be brought together, and preserved in coaptation by means of a bandage applied round the knee.

Q. What treatment does perpendicular fracture of the patella require ?

A. The treatment necessary in this case, differs very little from that of transverse fracture of the patella.

Fracture of the Bones of the Leg.

Q. What symptoms present themselves when both bones of the leg are broken at once?

A. Loss of motion, pain, crepitus, swelling and deformity of the leg, and preternatural mobility of its lower part.

Q. In what direction are the lower fragments displaced when the fracture is transverse?

A. They are drawn backwards by the muscles situated on the posterior aspect of the leg, so that an angular projection is formed in front of the limb.

Q. In what direction are the fragments displaced when the fracture is oblique?

A. In this case, the lower fragments are drawn upwards and outwards, while the upper ones project forwards and inwards. The leg is of course shortened.

Q. What muscles draw the lower fragments upwards and outwards?

A. The gastrocnemius externus, the plantaris, the soleus, the tibialis posticus, the flexor longus pollicis pedis, the flexor longus digitorum pedis, and the peronei longus and brevis.

Q. How is fracture of the bones of the leg to be reduced?

A. The patient must be laid upon his back, with his thigh somewhat raised towards the abdomen, and his knee half bent. Extension and counter-extension should then be made, and as soon as the ends of the fragments are placed in coaptation, a firm splint passing beyond the knee and ancle joints, should be applied to each side of the leg; this finished, the limb must be laid on its popliteal surface, in a double inclined plane.

Q. What treatment is necessary when the tibia, or the fibula is broken alone?

A. Neither case is attended with any shortening of the leg, and with only a very slight displacement of the fragments, and all that is required is rest, and the application of a long splint to that side of the leg on which the fracture is situated. When the accident is complicated with luxation of the ancle joint, the treatment of course is less simple, as will hereafter be explained.

DISEASES OF THE JOINTS.

Q. With what diseases are the joints most commonly affected?

A. Inflammation; dropsy; white swelling; morbus coxarius; anchylosis; and loose cartilages forming in them. Joints are also subject to wounds, sprains, and dislocations.

Inflammation of the Joints.

Q. What symptoms are indicative of an inflamed joint?

A. Pain, swelling, redness, and increased heat, accompanied with inflammatory fever, more or less violent.

Q. How is inflammation existing in a joint to be subdued?

A. The local remedies are copious and repeated bleedings by means of leeches and cupping, conjoined, when the inflammation is moderate, with cold saturnine lotions; when severe, with warm fomentations and emollient poultices. The general remedies are purgatives, antimonials, and mild diluents.

Dropsy of the Joints.

Q. By what symptoms is dropsy of the joints characterized?

A. This disease is denoted by the appearance of a soft, indolent, fluctuating tumour over the site of a large articulation. The superincumbent integuments are not at all inflamed, and, the skin generally retains its natural colour; the affected joint feels weak, though its motions are but little impeded.

Q. What joints are most subject to dropsy?

A. The knee, wrist, ancle, and shoulder.

Q. By what means is this disease to be dispersed?

A. The most effectual remedies are blisters, friction, electricity, and compression by means of a bandage.

White Swelling.

Q. What are the symptoms of white swelling?

A. When a joint is attacked with this affection, it swells and grows painful; the swelling is firm and elastic, and the pain usually at first not very acute; the skin is not inflamed, nor undergoes any change of colour; as the complaint advances, the joint becomes more and more inflexible, and, from the bulk of the other parts of the limb diminishing, appears considerably enlarged; the pain at length increases, the skin ulcerates at several points, and a scrophulous matter is discharged through the openings; hectic symptoms then supervene, and, if the disease be not removed by amputation, the patient soon dies.

Q. How many species of white swelling are there?

A. Two; the rheumatic and the scrophulous. The former commences in the sinovial membrane; the latter, in the cancelli of the bone, and is, therefore, the most dangerous and difficult of cure.

Q. What treatment does white swelling require?

A. In the early stage of the complaint, relief is to be obtained from the use of leeches, blisters, caustic issues, and moxa, in conjunction with purgative and tonic medicines, iodine, and digestible nutritious diet. In the latter stage, when the structure of the bone is destroyed, and the health of the patient is declining, amputation is the only remedy.

Morbus Coxarius, or Hip Disease.

Q. Describe the symptoms and progress of morbus coxarius ?

A. At the commencement of this disease, the patient complains of a sense of uneasiness in the knee and hip, and acquires a sort of limping in his walk; the whole affected limb feels weak, and after a short time becomes emaciated, but considerably lengthened. In the further progress of the complaint, a severe pain arises behind the trochanter major, extending down to the knee, ancle, and foot; the patient at the same time is restless and feverish, the nates become flattened, the crista of the ilium is depressed, and the spine distorted. If no relief be administered, matter forms within the joint; the acetabulum and head of the femur are destroyed by caries, dislocation takes place upwards and backwards on the dorsum of the ilium, and the whole limb becomes permanently shortened ; the patient is now either destroyed by the excessive constitutional irritation, or, he recovers with an anchylosed joint.

Q. How is morbus coxarius to be treated ?

A. In the early period of the disease, if symptoms of inflammation exist, leeches, cupping, and warm fomentations to the hip, should be frequently prescribed, in conjunction with the use of mild purgatives. To these means should succeed the repeated application of blisters and caustic issues. In the last stage, when colliquative sweat and diarrhæa have come on, the practitioner can do little more than administer opium to mitigate the sufferings of his patient. If the complaint seem likely to terminate in anchylosis, the limb should be fixed in an extended position.

Anchylosis.

Q. What is meant by anchylosis?

A. Anchylosis is an adhesion of the articular surfaces of the bones, producing partial, or complete immobility of the joints.

Q. Into how many kinds is anchylosis divided?

A. Into two; the complete and incomplete. Anchylosis is termed complete, when it is produced by the extremities of the bones becoming united by ossific matter; and incomplete, when it depends upon a contracted state of the ligaments and muscles.

Q. From what causes does anchylosis arise?

A. From fractures and violent contusions of the joints; from white swelling, morbus coxarius, &c. When it occurs during the existence of the latter affections, it must be regarded as a desirable event.

Q. By what means may it be removed?

A. The complete kind is irremediable. The incomplete may be cured by frequent, but gentle motion of the joint, by friction, &c.

Loose Cartilages in the Joints.

Q. Explain in what manner these bodies are formed?

A. When the sinovial membrane is inflamed, its vessels discharge into the cavity of the joint a quantity of coagulable lymph; this soon becomes organized, and is ultimately converted into a cartilaginous substance.

Q. How are they to be dispersed?

A. Compression by means of a laced cap or bandage should first be tried; if this fail, the cartilaginous body should be cut out.

DISLOCATIONS.

Q. How have surgeons divided dislocations ?

A. They have divided them into simple and compound ; complete and incomplete ; primitive and consecutive.

Q. What symptoms are indicative of dislocation ?

A. Pain, swelling, and deformity of the joint, loss of motion, and an alteration in the shape, length, and direction of the limb.

Q. Describe how luxations in general are to be reduced ?

A. The patient being placed in a suitable position, and secured by proper contrivances, the practitioner should relax those muscles of the limb which appear most likely to offer any impediment to the reduction ; extension should then be made in the direction of the displaced bone, so as to dislodge it from the situation into which it has been thrown ; in proportion as it approaches the articular cavity whence it had escaped, it should be brought back to its natural position, and inclined to such a point, as will most effectually allow the overstretched muscles to recover their action, whereby, it may be drawn into its proper place.

Q. When the extending force cannot dislodge the head of the luxated bone, in consequence of the great strength and resistance of the muscles, what should be done ?

A. The patient should be bled to syncope, put into a warm bath, or have a nauseating dose of tartras antimonii given him.

Q. How are compound dislocations to be treated ?

A. The luxated bone should be replaced in its articular cavity by the method just described, the wound should then be closed by adhesive plaster, and healed if possible by the first intention ; proper measures must at the same time be adopted, to subdue the attendant inflammation. If the bone cannot be reduced by extension, the wound must be dilated ; and if after enlargement of the wound, the reduction cannot still be accomplished, the head of the bone must be sawed off.

Dislocation of the Lower Jaw.

Q. What are the symptoms of dislocation of the lower jaw?

A. Violent pain, inability to shut the mouth, and difficulty of swallowing and articulation. The lower jaw projects beyond the upper one; the cheeks and temples are flattened; a depression is perceived before the external meatus auditorius, and the saliva flows from the mouth in prodigious quantities.

Q. How many ways may the lower jaw be dislocated?

A. It can only be dislocated forwards, in which case, the condyles pass over the eminentiæ articulares, and lodge beneath the zygomatic arches; the coronoid processes at the same time come in contact with the malar bones.

Q. Are the ligaments of the joint injured?

A. The capsular ligaments are sometimes ruptured, but in general they remain entire; the lateral ligaments are never ruptured.

Q. What muscles appear to be much stretched?

A. The temporales, masseteres, and pterygoidei. The buccinator and submaxillary muscles, are, also, somewhat stretched.

Q. Describe the method of reducing luxation of the lower jaw?

A. The surgeon having covered his thumbs with thick leather, should place them as far back as possible between the molar teeth, and grasp the side of the jaw with his fingers; he should then press the bone downwards, and at the same time raise up the chin; this manœuvre brings the muscles into action, and the condyles are forcibly drawn up into the articular cavities. When both condyles are dislocated, it is better to replace first one, and then the other, than to reduce both at once.

Dislocation of the Clavicle.

Q. Which extremity of the clavicle is most frequently luxated?

A. The sternal extremity. The luxation may be forwards, upwards, or backwards. The first kind is the most frequent. Luxation downwards is prevented by the position of the cartilage of the first rib.

Q. By what causes is the luxation forwards produced?

A. By the shoulder being forcibly driven back. The accident is denoted by pain and the appearance of a tumour at the top of the sternum.

Q. What ligaments are ruptured, in dislocation of the sternal extremity of the clavicle forwards?

A. The radiated, capsular, and interclavicular ligaments; and the ligamentum rhomboideum.

Q. How is luxation of the sternal extremity of the clavicle forwards to be treated?

A. The surgeon should draw the shoulders upwards, backwards, and outwards; push the dislocated end of the bone into its proper cavity, and apply over it a firm compress; he should then place a small cushion under the axilla, confine the shoulders back by a bandage, bend the fore-arm, and suspend it in a sling.

Q. What causes produce luxation of the acromial extremity of the clavicle?

A. Falls, or blows violently depressing the shoulder. The injury is easily detected by a swelling at the top of the shoulder, by the pain in moving the arm, and by the inclination of the head to the affected side.

Q. What ligaments are ruptured in luxation of the acromial end of the clavicle?

A. The ligament conoideum, the ligament trapezoideum, and the capsular ligament.

Q. In what manner is this luxation to be reduced?

A. The shoulder should be pulled upwards and outwards, a cushion placed in the axilla, the luxated extremity of the bone pressed down and retained in its natural situation by a bandage, the shoulders should be braced back, the elbow fixed to the side, and the fore-arm bent and supported in a sling.

Dislocation of the Humerus.

Q. In how many directions may the humerus be dislocated?

A. Four; viz. downwards into the axilla; inwards into the fossa subscapularis; outwards into the fossa infra-spinata; and upwards behind the clavicle. Luxation downwards occurs most frequently; luxation upwards is always consecutive; and luxation inwards is sometimes primitive, sometimes consecutive.

Q. What symptoms attend dislocation *downwards?*

A. Pain and inability to raise the arm. The head of the humerus is felt in the axilla, the limb is lengthened, the fore-arm extended, and a depression is perceptible below the acromion of the scapula.

Q. In what situation does the head of the humerus lodge, in luxation *downwards?*

A. It lodges at the inferior costa of the scapula, between the subscapularis muscle and the long head of the triceps extensor cubiti.

Q. What parts are ruptured in luxation *downwards?*

A. The capsular ligament and tendon of the subscapularis muscle are always ruptured; and the tendons of the supra-spinatus and infra-spinatus are very frequently so. The tendon of the long head of the biceps is sometimes broken, sometimes torn from the bicipital groove; in general, however, it is merely over-stretched.

Q. What muscles are in a state of tension in luxation *downwards?*

A. The deltoides, the coraco-brachialis, the biceps, the long head of the triceps, the supra-spinatus, the infra-spinatus, the teres minor, and the pectoralis major.

Q. Into what situation is the head of the humerus drawn in *consecutive* luxation inwards, which sometimes succeeds dislocation *downwards?*

A. Into the fossa subscapularis, beneath the subscapularis muscle.

Q. By what muscles is the head of the humerus covered, while lodged in the fossa subscapularis ?

A. By the subscapularis, the pectoralis minor, the coraco-brachialis, the short head of the biceps, the pectoralis major, and the deltoides.

Q. In what manner is luxation of the humerus *downwards* to be reduced ?

A. The patient being seated in a chair, a broad towel must be put round the chest, under the axilla of the injured side, and another fixed to the humerus, just above the condyles ; the fore-arm should then be bent to relax the biceps, and the humerus raised to an obtuse angle with the trunk of the body, to relax the supra-spinatus and infra-spinatus ; extension should now be made directly outwards ; as soon as the head of the humerus has arrived at the edge of the glenoid cavity, the arm should be brought downwards and forwards towards the abdomen, and the extension discontinued, when the muscles draw back the bone into its natural situation.

Q. How is *consecutive* luxation *inwards* to be reduced ?

A. The patient must be seated, and the arm and fore-arm held as in dislocation downwards ; extension should then be made in the direction of the displaced humerus, to bring its head back into the axilla ; this being accomplished, the surgeon must finish the reduction according to the method recommended in dislocation downwards.

Q. What are the symptoms of primitive luxation *inwards ?*

A. The patient experiences very violent pain when the arm is brought forwards ; the head of the humerus is felt under the pectoral muscle ; the elbow is inclined backwards, and the length of the limb somewhat increased.

Q. In what place is the head of the humerus situated in primitive luxation *inwards ?*

A. It is lodged in the fossa subscapularis, and is covered by the same muscles as in *consecutive* luxation *inwards*.

Q. What parts are ruptured in primitive luxation *inwards?*

A. The capsular ligament is always ruptured; and the tendons of the supra-spinatus and infra-spinatus muscles, are sometimes torn from the humerus.

Q. What muscles are in a state of tension in luxation *inwards?*

A. The subscapularis, the supra-spinatus, the infra-spinatus, the teres minor, and the posterior part of the deltoides. The biceps, the long head of the triceps, the coraco-brachialis, the teres major, and the latissimus dorsi muscles, are also, somewhat stretched.

Q. How is primitive luxation *inwards* to be treated?

A. The patient being seated, and the limb fixed as in dislocation downwards, extension should be made outwards and backwards; immediately the head of the humerus is brought within the capsular ligament, the limb should be inclined forwards towards the chest, and somewhat upwards, when the muscles draw back the bone into the glenoid cavity.

Q. What symptoms are indicative of dislocation *outwards?*

A. Severe pain and difficulty of moving the arm. The head of the humerus is felt beneath the infra-spinatus and teres minor muscles, and the limb is lengthened, separated from the side, and inclined forwards.

Q. In what situation is the head of the humerus fixed in luxation *outwards?*

A. In the fossa infra-spinata; and is covered by the posterior part of the deltoid, by the infra-spinatus, and teres minor muscles.

Q. What parts are ruptured, and what muscles are over-stretched, in luxation outwards?

A. The capsular ligament and subscapularis muscle are lacerated, and sometimes the supra-spinatus is torn from its connexion with the humerus. The anterior part of the deltoides, the pectoralis major, the subscapularis, and the supra-spinatus, are much overstretched. The biceps, coraco-brachialis, long head of the triceps, the teres major, and latissimus dorsi, are slightly elongated.

Q. How is dislocation *outwards* to be treated ?

A. The patient being seated, and the limb placed as in dislocation downwards, extension should be made outwards, and somewhat forwards ; as soon as the head of the humerus is brought to the edge of the glenoid cavity, the limb should be carried backwards, and drawn down towards the side, when the bone slips into its natural situation.

Q. In what place is the head of the humerus lodged, in *consecutive* luxation *upwards?*

A. It is lodged at the root of the carocoid process of the scapula, behind the clavicle, between the serratus magnus and subscapularis ; the former muscle being situated on its mesial or inner, and the latter on its outer side ; and it is covered by the pectoralis minor, the coraco-brachialis, the short head of the biceps, the pectoralis major, and the deltoides.

Q. How is *consecutive* luxation *upwards* to be treated ?

A. The patient must be seated in a chair, and the limb moved about in various positions to disentangle the humerus from its new situation ; at the same time, extension should be made in the direction of the displaced bone, so that its head may again be brought down into the axilla ; this done, the reduction must be completed according to the plan recommended in luxation downwards.

Q. What parts prevent *primitive* luxation of the humerus *upwards?*

A. The acromion and carocoid processes ; the anterior triangular ligament of the scapula ; the conoid and trapezoid ligaments ; the capsular ligament ; the long head of the biceps ; the subscapularis ; the supra-spinatus ; and the coraco-brachialis muscles. The deltoides; the infra-spinatus; the teres minor; the teres major ; and latissimus dorsi, also, in some degree assist in preventing luxation *upwards.*

Dislocation of the Radius and Ulna from the Humerus.

Q. In how many directions may the bones of the fore-arm be dislocated from the humerus ?

A. Four ; viz. anconad or backwards ; thenad or forwards ; radiad or outwards ; and ulnad or inwards. Luxation backwards is the most common case.

Q. What are the symptoms of luxation *backwards?*

A. The joint is extremely deformed, painful, and swollen, and its motions are impeded ; the hand is in a state of constant pronation ; the olecranon is lengthened ; and the fore-arm is half bent and incapable of extension.

Q. What muscles are in a state of tension in luxation *backwards?*

A. The anconeus, the pronator radii teres, the supinator radii brevis, the brachialis internus, the biceps flexor cubiti, the triceps extensor, and the flexores digitorum sublimis and profundus. The flexor carpi radialis, the flexor carpi ulnaris, and the flexor longus pollicis, are also, somewhat stretched.

Q. What parts are ruptured in luxation *backwards?*

A. The capsular and lateral ligaments, and the anconeus muscle, are always ruptured. The annular ligament, the brachialis internus, the pronator radii teres, and the supinator radii brevis muscles are likewise sometimes lacerated.

Q. How is luxation *backwards* to be reduced ?

A. The patient being seated, one assistant must lay hold of the humerus at its middle part, while another grasps the fore-arm at its inferior extremity ; extension in the direction of the radius and ulna, and counter-extension should then be made, during which, the surgeon pushes the olecranon downwards and forwards into its natural cavity.

Q. What are the symptoms of dislocation *forwards?*

A. This accident cannot occur without a fracture of the olecranon, which is retracted, and felt projecting at the back of the humerus ; the elbow is bent backwards, and the coronoid process of the ulna forms a prominence on the thenal or anterior aspect of the lower extremity of the humerus.

Q. In what manner is luxation *forwards* to be treated?

A. Extension should be made backwards in the direction of the fore-arm, so that the sigmoid cavity of the ulna, may be replaced in its natural situation, that is, on the trochlea or larger articular surface of the humerus; this done, the fore-arm should be quite extended, the olecranon brought down to, and placed in coaptation with the ulna, and the same measures adopted as in fracture of the olecranon.

Q. What situation do the displaced bones occupy in luxation *radiad* or *outwards?*

A. The sigmoid cavity of the ulna occupies the small articular surface of the humerus, from which the head of the radius is completely thrown off. The case is detected by the pain, inability of performing flexion and extension of the fore-arm, the projection of the radius and internal condyle of the humerus at the opposite sides of the arm, the prone position of the hand, the half bent state of the elbow, and the flexion of the fingers.

Q. What ligaments are ruptured, and what muscles are over-stretched, in luxation *outwards?*

A. The capsular and lateral ligaments are always ruptured, and generally the annular ligament of the radius. The brachialis internus, biceps, triceps, pronator radii teres, flexor carpi radialis, palmaris longus, flexor carpi ulnaris, flexor digitorum sublimis, flexor longus pollicis, and supinator radii longus muscles, are in a state of tension.

Q. How is luxation *outwards* to be treated?

A. The articulating surfaces of the bones being disengaged by means of extension and counter-extension, the surgeon should grasp the elbow, and push the bones into their proper places.

Q. In what position are the bones fixed in luxation *inwards?*

A. The ulna is pushed off from the trochlea of the humerus, and the radius occupies its place. The accident is characterized by pain and swelling of the elbow joint, loss of motion, the half bent state of the fore-arm, and the projection of the ulna at the inner, and of the external condyle of the humerus at the outer side of the limb.

Q. What muscles are over-stretched in luxation *inwards?*

A. The brachialis internus, the biceps, the triceps, the supinator radii brevis, the anconeus, the supinator radii longus, and most of the extensor muscles of the hand, fingers, and thumb.

Q. How is luxation *inwards* to be treated?

A. By the same method as luxation *outwards.*

Dislocation of the Femur.

Q. How many ways may the femur be dislocated at the hip?

A. Four; viz. upwards and backwards on the dorsum of the ilium; downwards and inwards into the foramen thyroideum; upwards and forwards on the os pubis; and backwards into the sacro-sciatic notch.

Q. Are both the capsular and round ligaments lacerated, in luxation of the femur at the hip?

A. Yes; in whatever direction the bone may be displaced. The latter, however, sometimes remains entire in dislocation *downwards and inwards.*

Q. What symptoms are indicative of luxation *upwards and backwards?*

A. The joint is swollen, painful, and immoveable; the limb is shortened and incapable of being rotated outwards; the foot is inverted; the trochanter major turned forwards, and situated near the superior anterior spinous process of the ilium; the thigh is bent on the pelvis; the knee is inclined forwards; the hip is flattened; and a tumour is felt under the glutæi muscles.

Q. How is luxation *upwards and backwards* to be distinguished from fracture of the neck of the thigh bone?

A. In fracture, the foot is turned outwards, and the trochanter major backwards; the limb is rotated without difficulty, though the motion is attended with considerable pain; it is also easily lengthened by extension, during which, a crepitus is always very perceptible.

Q. What muscles are in a state of tension, in luxation *upwards and backwards?*

A. The obturat. intern. and extern., the gemini, the quadratus femoris, the psoas magnus, the iliacus internus, the pectinalis, the tricipites brevis and longus, and in some degree, the triceps magnus.

Q. Describe the method of reducing luxation *upwards and backwards?*

A. The patient must be laid on the opposite side, with his knee bent, and his pelvis securely fixed; extension should then be made across the opposite thigh a little above the knee; when the head of the femur is brought on a level with the acetabulum, the limb should be rotated outwards, and the extending force discontinued, when the muscles bring the bone into its proper situation.

Q. What are the symptoms of luxation *downwards and inwards* into the foramen thyroideum?

A. The head of the femur is felt at the upper and inner part of the thigh, the limb is considerably lengthened and inclined somewhat forwards, the knee is bent, and separated a great distance from the opposite one, and is with difficulty brought in contact with it; the buttock appears flattened, and the toes are generally turned outwards.

Q. What muscles are over-stretched in luxation *downwards and inwards?*

A. The tensor vaginæ femoris, the sartorius, the rectus femoris, the pectinalis, the triceps, the gracilis, the psoas magnus, the iliacus internus, the three glutæi, the pyriformis, the biceps, the semitendinosus, the semimembranosus, and in some degree the obturator internus, the gemini, and quadratus.

Q. Describe the method of reducing luxation *downwards and inwards?*

A. The pelvis being fixed, and the knee bent, the limb should be extended downwards and outwards; as soon as the head of the bone is drawn from its situation, the knee should be carried across the opposite one, and the limb rotated inwards; the surgeon at the same time drawing the upper part of the femur outwards away from the thyroid hole.

Q. What are the symptoms of luxation *upwards and forwards?*

A. The limb is shortened and drawn slightly backwards, the toes are turned outwards, and the head of the thigh-bone is distinctly felt in the groin, above Poupart's ligament.

Q. What situation does the head of the femur occupy in luxation *upwards and forwards?*

A. It lodges on the ascending ramus of the os pubis, at the lateral or outer side of the femoral vessels, and is covered by the iliacus internus and psoas magnus muscles.

Q. What muscles are in a state of tension in luxation *upwards and forwards?*

A. The three glutæi, the pyriformis, the quadratus, the gemini, and obturatores internus and externus.

Q. In what manner is luxation *upwards and forwards* to be reduced?

A. The pelvis being fixed, and the knee bent, an assistant extends the limb downwards and backwards, the surgeon then passing a towel under the upper part of the thigh, raises the head of the bone up, and carries it over the os pubis and margin of the acetabulum.

Q. What symptoms attend luxation *backwards?*

A. The head of the femur is felt behind the acetabulum, the length of the limb is somewhat diminished, the motion of rotation is greatly impeded, the knee is bent, and inclined forwards, and the feet are turned inwards or tibiad.

Q. What muscles are over-stretched in luxation *backwards?*

A. The same that are thus affected in luxation upwards and backwards, and some of them to a much greater degree.

Q. How is luxation *backwards* to be reduced ?

A. The pelvis being fixed, and the knee bent; the limb should be extended downwards and forwards across the opposite one; during this extension, the surgeon should lift the head of the bone over the margin of the acetabulum, by means of a napkin passed round the upper part of the thigh.

Dislocation of the Patella.

Q. How many ways may the patella be dislocated ?

A. Two, viz. tibiad or inwards, fibulad or outwards. Luxation outwards is of the most frequent occurrence.

Q. What are the symptoms of luxation of the patella *outwards ?*

A. The knee is extended and cannot be bent; a depression is felt in front, and a hard tumour on the outer side of the joint. The accident is to be remedied by fully extending the leg, pushing the patella into its natural situation, and applying a bandage loosely round the knee.

Dislocation of the Foot.

Q. In how many directions may the foot be dislocated ?

A. In four; viz. inwards, outwards, forwards and backwards. Luxation *inwards* is the most common case.

Q. What parts are injured in luxation *inwards ?*

A. The fibula is fractured, the malleolus internus is broken off, the capsular, deltoid and transverse ligaments are ruptured, and the peroneus longus, and the peroneus brevis muscles over-stretched.

Q. What parts are injured in luxation *outwards ?*

A. The malleolus internus is broken off from the tibia, the fibula is fractured, the capsular and external ligaments are lacerated, and the tibialis anticus, the tibialis posticus, the flexor longus digitorum, and the flexor longus pollicis muscles over-stretched.

Q. How are dislocations of the foot to be treated?

A. The patient being laid on his back, with his thigh and knee bent, extension should be made in the axis of the leg; the bones should then be pushed into their natural situation, and a splint, reaching beyond the knee and ancle joints, applied to each side of the leg, and secured by bandages; this done, the limb should be placed on its popliteal or posterior surface, in a double inclined plane.

THE END.

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